NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

BORDER SECURITY:
A CONCEPTUAL MODEL OF COMPLEXITY

by

Teia N. Stein

December 2013

Thesis Advisor: Rudy Darken
Second Reader: Nadav Morag

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

This research applies complexity and system dynamics theory to the idea of border security, culminating in the development of a conceptual model that can be used to expand exploration of unconventional leverage points, better understand holistic implications of border policies, and improve sense making for homeland security. How can border security be characterized to better understand what it is, and why are so many divergent opinions being voiced on whether it can be achieved? By demonstrating the border as a complex adaptive system (CAS) through the use of graphic system dynamics models, exploring by way of example the influences surrounding the movement of trade and transnational terrorists across borders, four policy-centric pillars became evident: 1) institutional capacity, 2) criminal capacity, 3) ability to move people and goods across borders rapidly, and 4) operational capacity. Culture, identity, adversarial adaptation, enforcement, and moral values influence and are influenced by, perceptions of what are seen as threats. This research illustrates the value of thinking in systems (instead of missions or programs), challenges assumptions of what borders and border security are thought to be, and intends to inspire creativity in thinking about 21st century borders: what they represent and the challenges they pose.

i

THIS PAGE INTENTIONALLY LEFT BLANK

BORDER SECURITY: A CONCEPTUAL MODEL OF COMPLEXITY

Teia N. Stein
Program Manager, U.S. Customs and Border Protection, Euless, Texas
B.A., American Military University, 2008
Master's Certificate in Business Analysis, George Washington University, 2011

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)

from the

NAVAL POSTGRADUATE SCHOOL
December 2013

Author: Teia N. Stein

Approved by: Rudy Darken, PhD
                 Thesis Advisor

                 Nadav Morag, PhD
                 Second Reader

                 Mohammed Hafez, PhD
                 Chair, Department of National Security Affairs

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

This research applies complexity and system dynamics theory to the idea of border security, culminating in the development of a conceptual model that can be used to expand exploration of unconventional leverage points, better understand holistic implications of border policies, and improve sense making for homeland security. How can border security be characterized to better understand what it is, and why are so many divergent opinions being voiced on whether it can be achieved? By demonstrating the border as a complex adaptive system (CAS) through the use of graphic system dynamics models, exploring by way of example the influences surrounding the movement of trade and transnational terrorists across borders, four policy-centric pillars became evident: 1) institutional capacity, 2) criminal capacity, 3) ability to move people and goods across borders rapidly, and 4) operational capacity. Culture, identity, adversarial adaptation, enforcement, and moral values influence and are influenced by, perceptions of what are seen as threats. This research illustrates the value of thinking in systems (instead of missions or programs), challenges assumptions of what borders and border security are thought to be, and intends to inspire creativity in thinking about 21st century borders: what they represent and the challenges they pose.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

CAS   Complex Adaptive System
CASoS   Complex Adaptive System of Systems
CBP   Customs and Border Protection
CRS   Congressional Research Service
C-TPAT   Customs-Trade Protection Against Terrorism

DHS   Department of Homeland Security

FAST   Free and Secure Trade

IP   Intellectual Property
IPV   Intellectual Property Violation

NAFTA   North American Free Trade Agreement
NII   Non-Intrusive Inspection

POE   Port of Entry
PPD-8   Presidential Policy Directive 8
PTSD   Post Traumatic Stress Disorder

SNRA   Strategic National Risk Assessment
SPP   Security and Prosperity Partnership
SWB   Southwest Border

TCO   Transnational Criminal Organization
TPP   Trans-Pacific Partnership
TTIP   Trans-Atlantic Investment Partnership
TTO   Transnational Terrorist Organization

U.S.   United States
USCS   U.S. Customs Service

VBIED   Vehicle Borne Improvised Explosive Device

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

A complex adaptive system (CAS) is a group of simple parts, items, and/or people that interact and collectively influence the behavior of a larger system. A CAS is irreducible to its parts, and the properties of the parts themselves cannot be combined to describe the whole. The key to understanding a CAS is recognizing and analyzing systemic behavioral patterns, which can then lend insight as to the interactions and behaviors between the parts of the system. Borders are such a system. They are more than a line separating countries. They serve as areas, regions, corridors, frontiers, and political and cultural interfaces. They are also economic hubs, influence foreign relations, reflect values (and fears), and can be used to start wars. These dynamics and relationships create the complexity that is the border CAS.

Border security programs reflect what are currently perceived as threats: people, activities, and things that may cause unmanageable national effects. The assumption is that the effects of these threats would be irreparable to the "American way of life," and thus, requires a protectionist, zero-sum control strategy. Yet, borders are interdependent and evolve with globalization, social and cultural migration, and technological growth. The border system cannot be secured, nor can threats be predicted. There is a disconnect between threat perception, protectionism, and the characteristics of the border CAS that illustrate a gap in knowledge that this thesis contributes towards bridging. Borders are cross-matrixed with many divergent people, activities, and things, both licit and illicit, and yet, the "American way of life" still stands. Given that threats are fear-based, border security programs reflect the fears and uncertainty of policy makers.

Single-issue border policies, such as the southern border fence and immigration reform, do not reflect coherence of system dynamics, are ill suited for the globalized 21st century, and create more vulnerabilities, such as the decentralization of criminal organizations, increased dangers placed upon migrants, and catalyzing criminal organizations to innovate smuggling methods (e.g., catapults, semi-submersibles, surgically implanting dogs). Moreover, understanding why the United States (U.S.) chooses to see something as a threat requiring both media and executive attention, as well

as excessive resources and force, is a key factor in understanding the border CAS. Agencies, adversaries, elected officials, nongovernmental organizations, and activists alike are part of the CAS, and thus, create dynamics through their behaviors. Critically self-assessing social, political, economic, cultural, and psychological influences, and motivations driving threat perception, are just as important to making sense of "why it is the way it is," as studying criminal behavior.

Globalization in its current form has blurred the efficacy and coherence of geo-political borders. The borders, from an institutional perspective, have become an all but declared proxy war zone that must be defended at any cost, from value-based, esoteric threats (i.e., a threat to a way of life). Yet, as evidenced by trade and economic policies, this defense becomes a hindrance to production and goods and services exchanges. The protectionist vision has created a border security industry grounded on force, surveillance, suspicion, and restriction. Simultaneously, economic and foreign interdependencies bolstering globalization require borders to be fluid, and policies associated with them facilitatory. As nations continue to expand economic and resource interdependencies in the name of growth, the systems of social welfare, identity, employment, criminal enterprise, and corporate interest also become interdependent and evolve.

Through modeling of 'transnational terrorist' and 'trade' cross-border movement, four policy-centric, external pillars that affect border security became evident: 1) institutional capacity and priorities, 2) criminal capacity and priorities, 3) the ability to move people and goods across borders rapidly, and 4) operational capacity and priorities. Culture, identity, adversarial adaptation, enforcement, and moral values influence and are influenced by, subjective perceptions of what is seen to be a threat. The border has been found to be a frontier landscape of globalization. It is a merger of "us" and "them:" domestic and foreign, rich and poor, secular and religious, individual and collective, social and political, moral and amoral. The border and border security serve as an intersection of interdependent, interconnected agents that respond, experience, learn, and adapt.

IMPLICATIONS AND SIGNIFICANCE

By recognizing the interconnectedness of institutional, operational, facilitation, and criminal capabilities, both foreign and domestic, leaders and policy makers can begin to understand the global implications of border characteristics, and security measures thereof. Prior to this research, it was not readily understood the degree to which seemingly unrelated phenomena, such as perceptions of identity or foreign economic policies, create fluctuations in border behaviors. The researcher believed economic interdependencies existed, but was surprised to discover the depth and breadth of social and cultural influences well beyond border regions. This discovery has the potential of completely reframing the function and reach of border security.

Through the study of borders CAS characteristics, a contribution has been made to furthering the fields of border security, national security, and social and foreign policy by providing additional insights into the nature of 21st century borders. Modeling the border CAS provides policy makers the opportunity to consider a new method of sensing situational awareness, a technique to draw associations between policy, perceptions, and behaviors, and a new perspective on what security programs are apt to achieve.

This thesis contributes to bridging a knowledge gap that exists in understanding the complexity of border security, dynamics that result in unintended consequences from and to foreign and domestic policies, and why measures of border security are so elusive. Furthermore, this thesis contributes to bridging the knowledge gap in making sense of how many divergent fields, such as psychology, defense, control, economy, globalization, and jurisdictional authority, connect and relate to one another in context of borders. This research can be used to expand the exploration of unconventional leverage points, better understand holistic implications of border policies, explore the institutionalization of systems thinking, and more broadly, improve sense making for homeland security.

As the border security complex continues to struggle with bridging 'security' with "facilitation and growth," social groups throughout the world in turn struggle with the effects these issues place upon their safety and identity. The conceptual model of the

border CAS is one step towards understanding the consequences of these struggles, and towards better informing policy decisions.

CONCLUSION

This thesis demonstrated that border security is a CAS. It demonstrated that the border is a living system, interconnected, interdependent, learning, and evolving along with other global systems. The border CAS influences and is affected by social and cultural identities, and technological advancements, which are important because CAS behaviors cannot be predicted, nor can they be controlled in an open society. This research is intended to provide a foundation from which coherence of borders and border security can be built; the conceptual model will not in itself achieve this end. The research focuses on historical context, perceptions, identity, and the subjectivity of threat. It does not describe all issues that affect border security, nor does it attempt to examine the logistical, legislative, jurisdictional, or legal constraints associated with border policies. Moreover, the conceptual model developed from this research is one-dimensional and does not visually present the multi-layered, multi-dimensional ecosystem that borders and border security create. Finally, this thesis does not provide a prescriptive solution to border security, quantitative evidence, or regional variances of border dynamics.

Leaders must begin to ask, "security for whom exactly, and for which moral value specifically?"[1] By exploring how differing social, political, cultural, and moral influences affect crime rates at borders, leverage points will begin to emerge. Insights will be elucidated as to how policies affect disparate sub-systems, systems, and systems-of-systems. The ecosystems of trade, radicalization, foreign policy, identities, and technology will be understood to create many highly complex adaptive systems, interconnected and constantly evolving. This thesis was one small step towards that end.

---

[1] Attributed to analysis provided by David A. Baldwin in "The Concept of Security," *Review of International Studies* no. 23 (1997): 5–26.

ACKNOWLEDGMENTS

THIS PAGE INTENTIONALLY LEFT BLANK

I.   INTRODUCTION

There is a myth that drives many change initiatives into the ground: that the organization needs to change because it is broken. The reality is that any social system (including an organization or a country or a family) is the way it is because the people in that system (at least those individuals and factions with the most leverage) want it that way.[1]

A.   THE PROBLEM

This research applies complexity and system dynamics theory to the concept of United States border security to develop a conceptual model that can be used to expand exploration of unconventional leverage points for border security, better understand holistic implications of border policies, and improve sense making for homeland security.

What is border security? How and against what benchmarks is achievement of border security measured? What constitutes a measure of effectiveness for protection? These are all questions presented to representatives of the Department of Homeland Security (DHS) by Congress, the administration, and more frequently, the public. While it is not the goal of this thesis to answer these questions, this work will illustrate whether a conceptual complex adaptive system (CAS) model would help to do so, and improve understanding as to why the border environment 'is the way it is', while also alighting potential leverage points for systemic improvements. Developing a conceptual model of the complexity of border security to illustrate the value of thinking in systems (instead of missions or programs) is a second objective of this thesis. Lastly, this thesis intends to challenge assumptions of what borders and border security are thought to be, catalyze discussions about the interconnections of identity and globalization, and to inspire creativity in thinking about 21st century borders: what they represent and the challenges they pose.

---

[1] Ronald Heifetz, Alexander Grashow, and Marty Linsky, *The Practice of Adaptive Leadership: Tools and Tactics for Changing Your Organization and the World* (Watertown, MA: Harvard Business Press, 2009), 17.

Five key attributes are used to describe a CAS:[2] 1) continuous adaptation of assumptions, expectations, values, and habits by interactive agents (i.e., schemata), 2) continuous adaptation of larger enterprise patterns of interaction, 3) agents individually striving for equilibrium, while also adapting to other agents' behaviors—creating numerous variations of behavior, 4) continuous learning patterns, or "feedback loops" between agents (which produce the co-evolution noted in attributes 1–3), and 5) adaptability of the agents and system rendering them free from authoritative control. This definition will first be used to argue that border security is indeed a CAS. Next, this definition will again be used so that these attributes can be identified, described, and mapped within a conceptual model of border security, to represent the CAS visually.

Institutionalizing system and complexity thinking is a necessary first step towards understanding and navigating complex adaptive systems. Systems thinking is critical to comprehending the dynamics of interdependencies, relationships, and identification of effective performance measures. Immigration, trade, crime, terrorism, and enforcement are behaviors created and reinforced by system dynamics. What environmental factors (natural, political, social, structural, economic, moral) influence these behaviors to occur? What creates the increases and decreases in these behaviors? What, where, when, and how do social, economic, cultural, religious, and political factors affect these behaviors? How do these behaviors change over time and space? These questions reflect systems thinking. The answers to these questions are used to develop patterns. Understanding these patterns is sense making.

This research demonstrates that the border is a CAS, exploring by way of example, the influences surrounding the movement of trade and transnational terrorists across borders. Fluctuations within the border system are shown not to come from mechanistic processes (e.g., automating manifests, machine readable passports, enhanced drivers licenses, portal monitors), but from learned human behaviors and individual

---

[2] James E. Prewitt, Dick Weil, and Anthony Q. McClure, "A Complex Adaptive Systems Approach to Strategic Planning," *Asian Journal of Business and Management Sciences* 1, no. 11 (2012): 97–98, http://www.ajbms.org/articlepdf/ajbms201211i11111.pdf.

responses to what are seen as threats, such as identity, perceived fairness of policies, quality of information, desired security levels, and acceptable cost.

B.   THE NEED

As technology and threats rapidly adapt in a changing and budget-constrained environment, the homeland security project must also adapt its missions, strategies, and performance to seek balance between optimization (limiting redundancies), efficiency (speed), and effectiveness (achieve intended objective). The complexity of social system dynamics limit predictive capabilities, and render traditional performance measures useless. The number of people interdicted at or between ports of entry, for example, does not inform decision makers as to the security of the border. Similarly, the kilograms or pounds of drugs seized do not inform the state of the drug trade.

Borders are interdependent and evolve with globalization, social and cultural migration, and technological growth. Understanding the current state of border regions, lines, corridors, frontiers, and social and cultural exchanges, is necessary to improve decision-making. Single-issue border policies, such as the southern border fence and immigration reform, are ill suited for the 21st century, and create more asymmetrical threats, such as decentralization of criminal organizations, increased dangers placed upon migrants, and catalyzing criminal organizations to innovate smuggling methods (e.g., catapults, semi-submersibles, surgically implanting dogs).

A model is needed that captures both the complexities and inherent dynamic attributes of the border security enterprise if any meaningful analysis of the system is desired. Further, such a conceptual model would enable development of computational models and the testing of multiple policy, strategy, and tactical alternatives through simulation. Simulations would save money, aid decision makers in identifying key leverage points within the system, and mitigate unintended consequences that result from an incomplete understanding of the border security enterprise. A coherent and usable, conceptual model is the first requisite step.

C.   THE QUESTION

How can border security be characterized to understand better what it is, and why so many divergent opinions exist as to whether it can be achieved? Would the historical context of U.S. borders help to understand better what form and function border security serves today? Do social, cultural, economic, or identity factors affect how threats are perceived, and by extension, border vulnerabilities?

D.   THE SIGNIFICANCE

This thesis contributes to bridging a knowledge gap that exists in understanding the complexity of border security, dynamics that result in unintended consequences from the implementation of foreign policies, and why measures of border security are so elusive. The results of the research are used to construct a conceptual (i.e., theoretical) model that can be used to further study, and eventually, test variables of border dynamics and alternative policy options.

E.   LIMITATIONS OF RESEARCH AND MODEL

This research explores whether border security is a living system. In other words, whether characteristics of complex adaptive systems are present, and if so, whether this finding contributes to better understanding the challenges 21st century borders pose to the concept of measuring effectiveness of border policies, identifying unconventional leverage points for border security, and more broadly, improving sensemaking for homeland security. This research is intended to provide a foundation from which coherence of borders and border security can be built; the conceptual model will not in itself achieve this end. The research focuses on historical context, perceptions, identity, and subjective threat. It does not describe all issues that affect border security, nor does it attempt to examine the logistical, legislative, jurisdictional, or legal constraints associated with border policies. Moreover, the conceptual model developed from this research is one-dimensional, and does not visually present the multi-layered, multi-dimensional ecosystem that borders and border security create. Finally, this thesis does not provide a prescriptive solution to border security, quantitative evidence, or regional variances of border dynamics.

F.   METHOD

A graphic model was chosen to illustrate visually the complexity of border security. System dynamics was chosen as the archetype for the conceptual model to convince the reader, through visual illustration, that border security is not a linear, geographic, or static process, but rather, a complex adaptive system with dynamic behavioral attributes that respond and evolve (both positively and negatively) to policy implementations.

Modeling the entire domain of border security manually in a single model is untenable, so the researcher identified two issues within the system (trade and terrorist movement), and built several smaller models with fewer variables to demonstrate specific phenomena. While these models were not built using software tools (which would convert them from conceptual to computational), techniques were used that may aid in making this conversion.

Relationships between actors and elements are explained at the macro-level, and how they exist present day. Details associated with process workflows are not within the scope of this model. Components, relationships, elements, and influences were selected for incorporation if they were found to have a geographical, functional, social, strategic, financial, technological, or have oversight nexus to borders.

G.   THESIS OVERVIEW

1.   Chapter II—Literature Review. This thesis continues with a literature review of complex adaptive system, border security, and usefulness of system dynamics modeling. The purpose of the literature review is to frame the definitions and characteristics associated with these concepts. This framing provides the foundational underpinnings from which the researcher identifies, conceptualizes, and in turn, models the border security system.

2.   Chapter III—A Brief History of U.S. Borders. This chapter explores a historical review of U.S. borders, and what purpose they were seen to serve. This chapter is not intended to be a comprehensive historical record, nor is it a thorough accounting of all nuances related to historical events. The objective of this chapter is to provide the

reader with a historical perspective of how and why competing perceptions and goals of the U.S. border exist present day. Understanding the history will elucidate why confusion is growing as to what border security is (or should be).

Borders can be at once, a line, region, corridor, community, a reflection of values, and a node. One constant throughout border dialogue, however, is the view of a separation between "us" and "them;" an intersection between cultures, political control, resource ownership, control of transit from one point to another, and a division between national identities. It would, therefore, prove helpful to become familiar with how U.S. borders have evolved to present day, to better understand border security as a CAS.

3.   Chapter IV—Perception of Threats. Chapter IV explores some open source concepts of threats to discuss briefly some contradictions in the understanding of what constitutes a threat and limitations to the coherence of border security that these issues create. The objective of this exploration is simply to call into question the common assumptions of what a threat is understood to be.

4.   Chapter V—Modeling Complexity. This chapter explores some of the direct and indirect influences, information flows, and rate controls that affect the behavior of the border system, such as trade agreements, radicalization, perceived identity loss, acceptable costs, institutional, capabilities, and desired levels of security. Two border issues are presented, (1) transnational terrorists, and (2) trade. These two issues were chosen based upon their many intersections with the existential ideologies of an American way of life, regional, national and global economic dependencies, the intersection of defense and protection, and the frequently cited importance of these issues in homeland security budget justifications. An attempt is made in this chapter to demonstrate that border security is a concept that is reinforced through subjectively perceived threats rooted in the influence of foreign, social, and economic value systems, non-linear and non-enforceable. The effects of these influences upon people create the dynamics that frame the border as a CAS, catalyze adaptive behaviors, and demonstrate the need to re-think the form and function of border security. Stock and flow diagrams are the modeling technique used to present the basic elements, activity flows, rate

controls, and a sampling of feedback loops influencing movement around and through borders.

The chapter ends by presenting the holistic conceptual model associated with the institutional, operational, facilitation, and criminal pillars, and a sampling of influences that interconnect them. This conceptual model provides a visual representation of the interconnected influences that holistically contribute to the behavior of the border CAS. The objective of this model is to contribute to a better understanding of why single-issue policies, such as deploying technologies along the border, will not lead to secure borders, and may in fact, create more vulnerabilities.

5.   Chapter VI—Conclusion. This chapter re-states the problem, research question, and challenges posed by 21st century borders that necessitate understanding the border as a CAS. The research findings are summarized to describe how the conceptual CAS model can further efforts to understand better what border security is. The value of why thinking in systems (relationships and feedback instead of missions and programs) is necessary to bridge the gap in border coherence is also explained. The chapter ends with future research recommendations to further modeling efforts.

6.   Chapter VII—Post Conclusion: Moving Forward. Chapter VII provides the reader with practical recommendations to develop, verify, and validate the CAS model through testing and simulation. This chapter is intended to provide considerations on how the conceptual model presented herein can be transformed from theory to usability. The chapter concludes with suggested steps towards institutionalization of systems thinking, government wide, which will enable the wider application of the analytic and modeling techniques demonstrated throughout this thesis to other homeland security topics.

THIS PAGE INTENTIONALLY LEFT BLANK

II.   LITERATURE REVIEW

When border policies are implemented, can anyone predict what will occur throughout industries, communities, and societies that interface with the border: systems such as financial and consumer markets, manufacturing, foreign relations, criminal organizations, and cultural identities? Is it these interfaces that characterize a complex adaptive system (CAS)? The objective of this literature review is to explore published information, to assess what is known and accepted about CAS, borders and border security, and where disagreements and gaps exist. This review is separated into three sections: 1) characteristics of CAS, 2) border security, and 3) the value of system dynamics modeling.

The Level 1 alert order, an order one step below a complete closure of the U.S. border, was issued to all air, land, and sea ports of entry by 11:00 a.m. on September 11, 2001. The U.S. Customs Service (Department of Treasury) and the Immigration and Naturalization Service (Department of Justice) commenced executing the order through full examination and inspection of all cargo, vehicles, and people approaching the border.[3] Hours later, all air borders were completely closed, re-opening on a limited basis three days later.[4] Within just a few days of implementation, the effects of this border policy became evident on a global scale; border security is interconnected with international and domestic economic, political, social, and diplomatic systems.

Queue wait times to cross the border increased, from minutes to hours. Local police and fire departments on both sides of the border managed the consequences of traffic jams, abandoned vehicles, and overheating live animal cargo. The Red Cross and Salvation Army deployed to aid stranded drivers with no food, water, or toilets.[5] Computer manufacturers in Taiwan, Singapore, and South Korea could not ship their

---

[3] Edward Alden, *The Closing of the American Border: Terrorism, Immigration, and Security Since 9/11* (New York: Harpers Collins Publishers, 2008), 42.

[4] Ibid., 47–40; % U.S. trade by value (air freight); ½ of that value transiting via dedicated air cargo planes.

[5] Ibid., 43; Ambassador Bridge, 12–18 hour delays, City of Windsor, Red Cross and Salvation Army-food/water, Ontario provincial police-toilets, fire departments-cooling live cattle shipments.

products, which consequentially left domestic distributors short stocked. Mexican agricultural and manufacturing industries issued forced layoffs due to significant shipment delays. Governors from states along the northern U.S. border with Canada, facing severe local economic losses, began petitioning the President to deploy increased numbers of National Guard units to help speed up border inspections. Washington State, for example, experienced a 50% drop in tourism and lost over $100 million in local revenue because of the security posture.[6] The auto industry, with their just-in-time production methodology, had to shutdown manufacturing due to parts shortages resulting in a 15% market share loss, and Canadian suppliers losing the approximate value of $1–1.5 million/hour.[7] Ford, for example, had to close five assembly plants throughout the United States, General Motors had to reduce or cancel work shifts at four U.S. plants, and Chrysler had to re-structure its supply chain cross-border logistics from commercial trucking to rail to keep production lines active. Civilians in Kentucky, Washington, Michigan, Tennessee, Canada, and Mexico lost wages and/or jobs. In one week, security measures at the U.S. border created supply chain shortages that reverberated around the world.

Border policies, behaviors, and relationships create global and domestic implications. The economic effects experienced from the Level 1 policy described above, opened a much larger debate that continues to this day. The debate centers on determining what border security actually means, whether it can be achieved, and if so, how it should be measured. This center, in turn, pivots around balancing often-conflicting objectives of "facilitation" (i.e., rapid crossing) and "security" (i.e., protection).

The breadth and depth of the global and domestic implications of border security are still not well understood, nor are all the intersections and leverage points known from which to mitigate adverse effects of security policies. Additionally, literature does not demonstrate any consistency as to what a border or border security means, by which to base analysis to determine implications and leverage points. For example, in one Congressional Research Service (CRS) report, Jennifer Lake describes four functional

---

[6] Alden, *The Closing of the American Border: Terrorism, Immigration, and Security Since 9/11*, 4.

[7] Ibid., 45.

areas as "border security:" (1) immigration, (2) cargo, (3) transportation, and (4) maritime.[8] In a different report, Marc Rosenblum references threats, such as illegal migration, communicable diseases, criminal networks, potential terrorists, and goals, such as facilitation of trade and travel, as border security.[9] What is security? What constitutes a threat to whatever security is? Are the threats Rosenblum refers to, threats to border security, or are they the visible manifestations of deeper and broader social, economic, political, and identity hazards? Would it not be reasonable to consider these deeper, broader hazards as the true threats to border security, as opposed to their manifestations?

How can a territorial boundary, a geographically defined concept, influence and affect global, local, and corporate economies and values? Rather than function, capability, threat, or geographic descriptors, could the border be viewed from a living systems perspective? This view would presuppose the border as a living part of a community, which in turn, is a living part of a nation or world ecosystem. What messages does the border send to the ecosystem, and vice versa? What pathways are used to communicate those messages? Is it possible to know when a border is healthy? Staying with the living system analogy, what are the viruses and bacteria (i.e., threats) that could infect borders? What exactly is a border, given its interfaces with socio-political and economic systems? In addition, what do these interfaces mean for homeland security policy makers?

Understanding the characteristics, functions, structures, and boundaries of the U.S. border CAS, is a necessary foundation for any border security policy analysis. Conceptualizing the border as a CAS is not an easy task. The volume of relationships of interwoven processes and policies, authorities and social groups that function within, around, and/or through the border increases complexity. Additionally, stakeholders exist that have a vested interest in maintaining the traditional view that the border is but just a

---

[8] Jennifer Lake, *Border and Transportation Security: Overview of Congressional Issues*, CRS Report RL32705 (Washington, DC: Library of Congress, Congressional Research Service, 2004), 2.

[9] Marc C. Rosenblum, Jerome P. Bjelopera, and Kristen M. Finklea, *Border Security: Understanding Threats at U.S. Borders*, CRS Report R42969 (Washington, DC: Library of Congress, Congressional Research Service, 2013), 4. http://www. fas.org/sgp/crs/homesec/R42969.pdf.

checkpoint, others understand the border as something linear and static, to be hardened as a defense measure. Others still conceive the border to be a reflection of social values, for example, openness, community, acceptance, trust, individuality, suspicion, distrust, or a sense of superiority.

Understanding how and where these influences fit into the holistic view of the border is critical to developing effective security policies, as they can impact institutional effectiveness, and possibly, result in unintended consequences.

This literature review identifies the fundamental characteristics of CAS, the definition and meaning of contemporary border security, and the value of system dynamics modeling. Findings from the research are used to identify and conceptually model the U.S. border system with the intention of furthering research towards a better understanding of border policy implications.

A.   CHARACTERISTICS OF COMPLEX ADAPTIVE SYSTEMS (CAS)

A system is defined as a "regularly interacting and interdependent group of parts, items, or people that form a unified whole with the purpose of establishing a goal."[10] A formally accepted definition is not available in literature for a complex system, but Mitchell describes it as "a large network of relatively simple components with no central control, in which emergent complex behavior is exhibited."[11] Furthermore, a CAS, yet more difficult to define formally, is commonly understood as a system "composed of populations of adaptive agents whose interactions result in complex non-linear dynamics, the results of which are emergent system phenomena."[12] Plainly stated, a CAS is a group of simple parts, items, or people that interact, and collectively influence the behavior of the larger system, behavior of which is irreducible to its parts.

---

[10] Annabel Beerel, *Leadership and Change Management* (Thousand Oaks, CA: Sage Publications, 2009), 35, http://www.sagepub.com/upm-data/27451_02_Beerel_Ch_02.pdf.

[11] Melanie Mitchell, *Complex Systems: Network Thinking*, Working Paper 2006–10–036 (Santa Fe, NM: Santa Fe Institute, 2006), 2.

[12] Jason Brownlee, *Complex Adaptive Systems*, Technical Report 070302A, Complex Intelligent Systems Laboratory (Melbourne, AUS: Swinburne University of Technology, 2007), 1.

System behavior can be observed holistically, which lends insight as to the interactions between the parts, items, or people within the system. Are there specific characteristics that create a CAS? Researchers have attempted to identify these characteristics since the 1970s, when complexity studies first began. A debate continues as to a formalization of known characteristics.

De Weijer associates dynamic social behaviors as a principle characteristic. Capra associates interdependencies. Gell-Mann associates feedback loops, randomness, learned behavior (i.e., memory), and evolution.[13] Juarrero also associates feedback loops as a characteristic of a CAS; however, views this phenomena not of randomness like Gell-Mann, but from one of interpersonal relationships.[14]

Structurally, another divergence in the literature exists regarding building blocks. Dodder and Dare associate agents (people, parts, items) at one level of a system as being the building blocks for agents at the next level; a hierarchical perspective.[15] Capra disagrees, and is careful to note that no building blocks exist in systems. Living systems, Capra explains, are nodes of networks within networks, at all varying levels of the system, which, in turn, interact with other systems. Capra relates a CAS "structure" not to that of hierarchy, but to concepts of quantum theory. In other words, at the subatomic level no matter exists, just "patterns of probabilities."[16] Juarrero goes further and describes that boundaries of a system are just as much a part of the system as the relationships (interactions) within the structure. The boundaries of a system can expand or contract as a result of the feedback loops associated with interactions between agents, and between agents and the system. This expansion and contraction (i.e., evolution)

---

[13] Murray Gell-Mann, "Complexity and Complex Adaptive Systems," in *The Evolution of Human Languages. SFI Studies in the Sciences of Complexity*, Proceedings, X: 3–18, ed. J. A. Hawkins and M. Gell-Mann (Reading, MA: Addison-Wesley, 1992), 11, http://tuvalu.santafe.edu/~mgm/Site/Publications_files/MGM%20107.pdf.

[14] Alicia Juarrero, "Complex Dynamical Systems Theory," *Cognitive Edge Network*, 2010, 3, http://cognitive-edge.com/uploads/articles/100608%20Complex_Dynamical_Systems_Theory.pdf.

[15] Rebecca Dodder and Robert Dare, *Complex Adaptive Systems and Complexity Theory: Inter-related Knowledge Domains* (Cambridge: MA: Massachusetts Institute of Technology, 2000), 2, http://web.mit.edu/esd.83/www/notebook/ComplexityKD.PDF.

[16] Fritjof Capra, *The Web of Life: A New Scientific Understanding of Living Systems* (New York: Anchor Books, 1997), 30.

reflects interdependency between the parts of a system and the system as a whole. Additionally, Juarrero describes how the system structure itself is formed by the patterns of the relationships between agents, and between the agents and the system. Connectivity and interaction are the key characteristics of this shaping, and are the basis for complexity and self-organization.[17]

Although researchers have not yet agreed on all characteristics of a CAS, some key similarities do exist. Dodder and Dare, for example, discuss 1) systemic tendencies to seek an optimal balance between order and the edge of chaos, 2) networks of agents that learn from one another and create the environment of the system by means of their interactions (learning theory), and 3) co-evolution of both agents and the system as a whole.[18] Gell-Mann similarly references learning behavior as a characteristic of CAS. He describes how "regularities of experience" are "recorded" and "compressed" by both agents and the system, into a model or schemata, which is then shared throughout the system via feedback loops. All other more "chance" information is discarded. This feature, Gell-Mann explains, is what characterizes a complex system as adaptive.[19]

Gell-Mann writes that one of the most important characteristics of a CAS is how properties of the parts of the system cannot be combined to describe the whole. Rather, that a "crude look at the whole" is a necessary first step, from which simplifications will emerge.[20] Similarly, Capra writes that properties of the parts of a system cannot bring coherence to the larger whole.[21]

Brownlee compiled lists of four complexity theorists' perspectives on characteristics of CAS: 1) Murray Gell-Mann, 2) John H. Holland, 3) W. Brian Arthur, and 4) Simon A. Levin. Whereas Holland, Arthur, and Levin describe principles and

---

[17] Juarrero, "Complex Dynamical Systems Theory," 2.

[18] Dodder and Dare, *Complex Adaptive Systems and Complexity Theory: Inter-related Knowledge Domains*, 6.

[19] Gell-Mann, "Complexity and Complex Adaptive Systems," 10–11.

[20] Ibid., 14.

[21] Capra, *The Web of Life: A New Scientific Understanding of Living Systems*, 29.

properties as characteristics, Gell-Mann describes cyclic behavioral elements and system lifecycle issues. These perspectives are summarized in a table presented in Appendix A.

B. BORDER SECURITY

Nation-states are separated by geographical boundaries, and presuppose separate and distinct institutions. Yet, growing debate is occurring as to whether the meaning of borders is shifting, and whether nation-states are still functionally separate from one another. Borders are most commonly understood to represent the "territorial exclusivity of the nation-state…mak[ing] of the border a line that divides the national and the global into two mutually exclusive domains."[22] A formalized definition of security does not exist, but it can generally be understood as the process of identifying threats, and taking measures to protect against them. Furthermore, border security is difficult to define, but can be thought of as control of territorial boundaries.[23] Simply put, border security is currently understood as the process by which the separation between nation-states is protected against external (read, distinctly foreign) threats.

By its very nature, globalization discards "mutual exclusivity." Trade and international bordering are just two examples of the effect of globalization, where pre-clearance inspection or certification sites for one country are located well inside that of another, away from geographical borders.[24] If protection of the separation between nation-states represents border security, and by extension protection of sovereignty, how does globalization fit into the picture, where global interests are shared, interconnected, and borderless? How is the view of security shifting, if at all, as result of globalization? Is the concept of border security changing?

---

[22] Saskia Sassen, "When National Territory is Home to the Global: Old Borders to Novel Borderings," *New Political Economy* 10, no. 4 (December 2005): 523, http://www.saskiasassen.com/PDFs/publications/When-National-Territory-is-Home-to-the-Global.pdf.

[23] In a December 2012 report, the U.S. Government Accountability Office (GAO) explained, from fiscal year 2004 through fiscal year 2011, border security was defined by the border patrol as "operational control" (interchangeably referred to as "effective control"). This meant the number of miles that the border patrol was able to detect, respond, and interdict "illegal activity." U.S. Government Accountability Office, *Border Patrol: Key Elements of New Strategic Plan Not Yet in Place to Inform Border Security Status and Resource Needs*, (2012), 10–11.

[24] Sassen, "When National Territory is Home to the Global: Old Borders to Novel Borderings," 530.

Huysmans argues that the concept of security is expanding to include economic, societal, political, and environmental threats, which implies the linking of survival of the individual, ecological, community and more.[25] He describes the identification of threats as being driven by a "double fear," that is, fear of death and fear of uncertainty. It is this "double fear" and the absence of reason it creates, Huysmans says, that leads to the objectifying of death as a concrete danger, such as criminals and evils, and the entry of mediating agencies, such as political communities and churches.[26] Whereas Huysmans describes security in the context of fear, death, and threat, Rothschild analyzes the concept from a principle-based view. She argues that four purposes exist for using principles to define or describe security that commonly frame the subject: 1) theoretical derivations are important organization of policy, 2) principles guide public opinion and the way they think about security, 3) a mechanism by which to contest existing policies, and 4) a mechanism by which to influence distribution of money and power.[27] Furthermore, Rothschild refers to "extended security," from which four (4) principle-bounded forms have emerged: 1) security extended from nations to groups and individuals, 2) security extended from nations to the international, supranational systems, 3) extension of the types of security (e.g., from military to political, economic, social, environmental), and 4) extension of responsibility for security in all directions (e.g., from nation-state to international institutions, to local government; to nongovernmental organizations, to public opinion and media, to forces of nature and market).[28] Although Huysmans and Rothschild diverge on the foundation of the concept of security (fear and principle, respectively), they do appear to agree that the nature of security has evolved and is becoming highly interconnected and interdependent with social, economic, political, and environmental systems.

---

[25] Jef Huysmans, "Security! What Do You Mean? From Concept to Thick Signifier," *European Journal of International Relations* 4, no. 2 (June 1998): 227.

[26] Ibid., 235, 238.

[27] Emma Rothschild, "What is Security?" *Daedalus* 124, no. 3, The Quest for World Order (Summer 1995): 59, http://www.jstor.org/stable/2002731.

[28] Ibid., 55.

Jurisdictionally, Sassen claims that globalization "is producing ruptures in the mosaic of border regimes underlying the international system of exclusive territorial demarcations."[29] Stated another way, the meaning of national boundaries is being questioned due to changes in territorial authorities and rights. Whereas borders have historically represented state jurisdiction and institutional control, new forms of borders are emerging, over which supranational authorities, such as foreign investment and the reach of international agreements, have jurisdiction and control inside of another nation-state. Spolaore discusses how expansion of borders may lead to political costs, due to diversification of communities and desired services of government. Spolaore continues to state that with this diversification (heterogeneity), comes disparate "cultures, values, norms, habits, languages, religions, ethnicities" and disagreements "over the fundamental characteristics of the state."[30] Whereas Sassen associates globalization with shifts in nation-state authorities, Spolaore associates social and cultural elements that create evolution in the value of states. These divergent perspectives have key similarities that can tangibly affect changes in the meaning and context of border security practices and policies, the CAS characteristics of evolution and adaption of the values and authorities of the nation-state.

Economically, Walkenhorts and Dihel associate increased border control measures with increased transport, handling, insurance, and customs costs (referred to as "frictional trading costs"), which makes "international trade more expensive and tend to reduce imports and exports."[31] Burt does not entirely agree. He claims "little evidence that tighter security measures have materially affected trade volumes" exists.[32] Whereas Burt analyzed the trade volume of Canada, Walkenhorst and Dihel analyzed global impacts beyond North America. This variance in analytic approach suggests increased

---

[29] Sassen, "When National Territory is Home to the Global: Old Borders to Novel Borderings," 523.

[30] Enrico Spolaore, "National Borders, Conflict and Peace," in *Oxford Handbook of the Economics of Peace and Conflict*, ed. Michelle Garfinkel and Stergios Skaperdas (Oxford: Oxford University Press, 2012), Chapter 30, 765, http://sites.tufts.edu/enricospolaore/files/2012/08/National-Borders-Conflict-and-Peace.pdf.

[31] Peter Walkenhorst and Nora Dihel, "Trade Impacts of Increased Border Security Concern," *The International Trade Journal* 20, no. 1 (2006): 23.

[32] Michael Burt, "Tighter Border Security and Its Effect on Canadian Exports," *Canadian Public Policy* 35, no. 2 (June 2009): 168.

border control measures in North America have differing effects on trade volumes in distinct regions of the world, over time, similar to CAS characteristic of the feedback loops of interconnections, interdependencies, and evolution of a system as a whole.

Similar to Huysmans discussion of double fear influencing the objectifying of threats, Salter and Mutlu use psychoanalytic theory to describe a unique interpretation of the meaning behind post-9/11 border security. Salter and Mutlu associate the trauma of 9/11 with a form of national post traumatic stress disorder (PTSD), from which a reshaping of both foreign policy and American identity has emerged in an effort to "balance death drives and erotic desires," which has manifested itself in excessive border policies, technologies, and programs.[33] They continue to associate two paradoxical functions of current border security measures, 1) "fix" insecurity of open borders, and 2) construct a version of America that does not need border security.[34] The influence of trauma on policy decisions and public perception is an example of cross-fertilization and influence between agents, similar to the social and systemic changes that occur within a CAS, as de Weijer explained, and emergent "order" as described by Dodder and Dare.

Psychology, defense, control, economy, globalization, and jurisdictional authority cannot be combined to describe "border security." Each are systems in their own right, associated with many other systems, such as social identities, business, transportation, law enforcement, manufacturing, and employment, to name a few. Each part interacts and is interdependent within a larger social and global construct, highlighting how many disparate parts critical to the functioning of the whole cannot be combined to describe the whole; a key characteristics of a CAS as described by Gell-Mann. Yet, policy makers still perceive borders as simply a geographic line requiring protection from "illegal crossings,"[35] which is evidenced by the current debates in Congress, where measurement

---

[33] Mark B. Salter and Can E. Mutlu, "Psychoanalytic Theory and Border Security," *European Journal of Social Theory* 15, no. 2 (May 2012): 186, 192.

[34] Ibid., 189.

[35] Laura Meckler, "Defining Border Security Key to Senate Immigration Talks," *The Wall Street Journal*, Updated February 1, 2013, http://online.wsj.com/news/articles/SB1000142412788732392610 4578278240287317724.

of border control is influencing the progress (or not) of domestic policies, such as immigration reform.[36]

C. THE VALUE OF SYSTEM DYNAMICS MODELING

Beerel finds that system thinking in general is an ability to identify root causes of problems, and in turn, more holistically see the world. This sight, or sense, results in awareness that solutions for systemic problems are not a quick fix or technical, and cannot be addressed in isolation. She further describes system dynamics as "a method for looking at the reinforcing and non-reinforcing behaviors that either support or challenge attempts to change."[37]

The research showed CAS dynamics exist through borders and border security. These are a result of behavioral interactions and interdependencies, and require a holistic view before any insights can be drawn as to cause and leverage. Thus, a system dynamics modeling technique would best serve to illustrate the behavioral complexity of border security.

D. SUMMARY

To re-state the findings above, a CAS is a group of simple parts, items, and/or people that interact and collectively influence the behavior of the larger system, behavior which is irreducible to its parts. Just as a CAS cannot be reduced to its parts, the properties of the parts cannot be combined to describe the whole. System behavior can be observed holistically, which lends insight as to the interactions and behaviors between the parts of the system. Both the parts and the system as a whole are adaptive when they record and share information and experience through feedback loops. As evidenced by the literature, significant global complexities exist in understanding borders and border security. A knowledge gap exists in making sense of how the divergent fields, such as psychology, defense, control, economy, globalization, and jurisdictional authority

---

[36] Stewart Powell, "Changing the Definition of "Border Security" Could Be Key to Immigration Overhaul," *Houston Chronicle*, February 27, 2013, http://blog.chron.com/txpotomac/2013/02/changing-the-definition-of-%E2%80%9Cborder-security%E2%80%9D-could-be-key-to-immigration-overhaul/.

[37] Beerel, *Leadership and Change Management*, 32–33.

connect and relate to one another, at and around the border. Each are systems in their own right, and are associated with many other systems, such as social and national identities, business, transportation, law enforcement, manufacturing, and employment, to name a few. Each part interacts and is interdependent within a larger social and global construct. An attempt is made to demonstrate those interconnections visually, via the conceptual model that is the product of this thesis. The next chapter briefly explores the history of U.S. borders to provide context of how the form and function of borders has evolved since 1783.

III.   A BRIEF HISTORY OF U.S. BORDERS

> The great ideals of national sovereignty, independence, nationality as the basis of states, were wonderful achievements in the eighteenth century, in a world which was so vast before the industrial revolution had begun. …But nothing is eternal in this world, and we are again in the throes of a crisis which demands reinterpretation of the foundations of our social life.[38]
>
> –Emery Reves

The Oxford Dictionaries defines "border" as "… *a line separating two political or geographical areas, especially countries*."[39] A line, however, does not explain the breadth and depth of global implications created by borders and efforts to secure them. Also not well conceived are all the intersections between borders and the domestic and global landscape, a landscape upon which strategies maneuver to shape 21st century security goals. As earlier described, literature is inconsistent as to how borders are defined, and what border security means. This chapter explores a historical review of U.S. borders, and what purpose they were seen to serve in the past. This chapter is not intended to be a comprehensive historical record, nor is it a thorough accounting of all nuances related to historical events. The objective is to provide the reader with a historical perspective of how and why competing perceptions and goals of the U.S. border exist present day. Understanding the history will better elucidate why confusion is growing insofar as comprehending what border security is (or should be).

Borders can be at once, a line, region, corridor, community, a reflection of values, and a node. One constant throughout border dialogue, however, is the view of a separation between "us" and "them;" an intersection between cultures, political control, resource ownership, control of transit from one point to another, and a division between national identities. It would, therefore, prove helpful to become familiar with how U.S. borders have evolved to present day, to understand border security better as a CAS.

---

[38] Emery Reves, *The Anatomy of Peace* (New York: Harper & Brothers Publishers, 1945), 131.

[39] "Border," Oxforddictionaries.com, accessed September 5, 2013, http://oxforddictionaries.com/us/definition/American_english/border.

A.   THE FOUNDING

Before, and immediately after, the United States achieved independence from Great Britain in 1783, national borders were not thought of in terms of distinct geographical lines. Rather, Europeans and colonists associated boundaries for territorial control of natural resources, trade, and frontier exploration. The intent of boundaries was to mark an area for further expansion. Land was wealth (materials and people), and waters were transportation highways and strongholds. With control of the seaports, a nation (or entrepreneur) controlled the wealth of the land to which it was connected. That wealth was natural resources and labor. The trade of those resources was the source of power. Control the territorial waters, lakes, and rivers, and the means by which to acquire that power was also controlled. The 1776 declaration issued by colonists to Great Britain was itself created as a direct result of restrictions placed upon resources, trade, and port commerce; restrictions that challenged merchant powers.[40]

1.   Frontier and Wilderness Exploration

Following the end of the Revolutionary War in 1783, the concept of national borders was still initially one of an opportunity for expansion. Fortification and control of physical border demarcations was not of conceptual importance, outside of perimeter security for trading posts, homes, states, towns, and seats of power. Rather, the goal of any national boundary was to serve as a frontier for growth and trade exchange. Westward, for example, the Northwest Territory (region west of the Allegheny mountains, northwest of the Ohio river), was acquired from Britain at the end of the war. This territory was seen as a wilderness to be explored and settled. These territories were frontiers where sovereignty of nation-states (Spain, France, England, and later Mexico, and Russia) blurred into and out of one another, gradually over hundreds, and at times, thousands of acres.

---

[40] Vincent Wilson, Jr., ed., *The Book of Great American Documents* (Brookfield: MD: American History Research Associates, 2003), 11.

2. Geological Boundaries and Settlements

The territorial lands were not seen as part of the Union; in other words, inhabitants of the territories were not inherently endowed with any participatory rights of governance. The only boundaries per se were the geological landmarks of mountains and rivers. As an illustration, the Continental Congress passed the Ordinance of 1787, which documented a framework for requirements of settlement. The ordinance established rules for inhabitants and settlers within the Northwest Territory, namely to contribute payment towards debts and protect interests of the United States The ordinance also stipulated terms for any settled region within the territory, to form a recognized state. This ordinance set the groundwork for westward expansion and growth, and demonstrated that borders were not as yet formally defined.[41]

3. From Independent States to Federalist Union

By 1786, just three years after the Revolutionary War, each state viewed their boundaries as borders that must be defended, and under the Articles of Confederation they were empowered to do so. The 13 states were independent, joined loosely by the Articles of Confederation (ratified in 1781), as a measure of common defense from other empires.[42] They built their own armies, created their own tariff laws (fees placed upon imported goods), negotiated trade agreements with foreign entities, and printed their own paper and coin currencies. New Jersey even created its own customs service. The absence of interstate commerce controls and standardization was what led to the Philadelphia convention of states, which in turn led to the dissolution of the confederacy and formation of the federal system known today. Again, issues of trade influenced this change. The Constitutional Convention, as it became known, was initially intended to revise the Articles of Confederation, with the sole objective of improving U.S. trade and commerce, and interstate cooperation. The convention ended with an agreement to

---

[41] Wilson, Jr., ed., *The Book of Great American Documents*, 21–25.

[42] Library of Congress, "Articles of Confederation," Primary Documents in American History, (n.d.), http://www.loc.gov/rr/program/bib/ourdocs/articles.html.

disband the confederation and replace it with a new, strengthened, three-branch federal structure. It was from trade and border dynamics that the U.S. nation-state was formed, through the emergence of the U.S. Constitution in 1787.[43]

Upon enactment of the Constitution in 1789, the U.S. Customs Service (USCS) was created by the fifth act of Congress. The objective of the service was to regulate and collect tariffs on all commerce entering U.S. territory through the national points of delivery (now ports of entry). Exports were not yet recognized as a priority for control measures. The USCS was the milestone that marked the formal shift of focus from state borders to those of the nation-state. The shift was grounded in the objective of revenue collection, not defense. The border was seen not as a line requiring security posture, but a perimeter with nodes of economic opportunity (sea ports). The USCS also served as the first Public Health Service and Bureau of Standards, given that contagious diseases carried by seamen, and standardization of weights and measures, were recognized as a critical part of the revenue paradigm. By 1835, the national debt accumulated from years of war, was paid in full from duties collected at the new national border.[44] It was during this period, 1789 forward, that the federal government began formalizing the northern and southern U.S. borders, through war, battles, treaties, and occupation.

B.   THE NORTH

Looking north, both the British and the United States maintained a naval presence in the Great Lakes following the end of the Revolutionary War. The region was maintained as a pseudo-militarized area, given the strategic location for both control of land and inland seaport access. Throughout the War of 1812, both sides used Lake Erie and Lake Ontario as their fleet manufacturing zones, on which a number of battles were also fought. Both countries entered into a shipbuilding competition (i.e., arms race) in the lake border region following the end of that war. The lake border region served as a battlefield, manufacturing, transit, and trade zone, concurrently. Oddly, during this time,

---

[43] Wilson, Jr., *The Book of Great American Documents*, 29.

[44] Anne Saba, "The U.S. Customs Service," *U.S. Customs Today*, February 2003, (n.d.), http://www. cbp.gov/xp/CustomsToday/2003/February/always.xml.

trade between the two countries increased. It was this burgeoning trade relationship, and wariness of war in general, that led to a disarmament agreement six years later. The Rush-Bagot Pact, also known as the Convention of 1818, established a limit of no more than two naval patrol vessels per country, with authority to navigate the Great Lakes. The waterways were conceived, from that point forward, as a demilitarized zone. The Rush-Bagot Pact also aligned the border just west of Angle Inlet (Minnesota) to the south, at the 49th parallel, then extending west until it reached the Rocky Mountains.

Also following the War of 1812, a number of land border disputes remained between the United States and British North America (now Canada). These disputes originated from the 1783 Treaty of Paris (the treaty that ended the Revolutionary War). Many commissions served over the next 30 years to negotiate agreeable boundaries. For example, islands off the coast of Maine were negotiated in favor of Great Britain. The St. Lawrence and other rivers near the Great Lakes region were divided to allow both countries to navigate for defense, transit, and trade. In 1842, the last of the northern borders east of what is now Minnesota, were resolved via the Webster-Ashburton Treaty.[45]

It is important to note that the border negotiations were not all about marking lines or areas for the purposes of sovereignty. Borders themselves served as resources for trade, and were subject to negotiation for use. For example, it was agreed to permit the United States indefinite fishing rights along the Newfoundland and Labrador coastlines.

The Rocky Mountains, and everything west and northwest of those, fell within what was called "The Oregon Territory," and was jointly occupied by both countries for 63 years. At the time, Russia claimed the Bering Straits for the purposes of commercial fishing, and both the United States and Great Britain claimed rights of use and settlement of the Oregon Territory; claims based on exploration teams and fur trading posts. It was not until masses of people migrated to the west via the "Oregon Trail" that U.S.

---

[45] U.S. Department of State, Office of the Historian, "Milestones: 1801–1829, Rush-Bagot Pact," (n.d.), http://history.state.gov/milestones/1801–1829/Ruch-Bagot.

congressional expansionists pushed hard for full control of the region (and its resources). The northwestern border known today was negotiated via the 1846 Oregon Treaty.[46]

During this time, social and political tensions over slavery had been brewing in the debate halls of Congress. Citizens were starting to polarize between abolitionist and pro-slavery ideologies. In 1839, the legitimacy of the slave trade was challenged via two legal cases. These cases expanded the dialogue of slavery beyond domestic social and political debate. Foreign diplomacy, state sovereignty, reach of executive powers, borders, and values all coalesced. This dynamic eruption occurred in large part because of what is known as "The Amistad Case." The Spanish cargo ship *La Amistad* ran aground on the coastal border of New York, after Africans who had been abducted and sold for the purposes of enslavement, mutinied, and took over the ship.

Spain viewed the ship and everything on it as the Queens property, and the arrest of the traders, proposed freeing of the slaves, and confiscation of the cargo was seen as a slight upon the Queens honor. Further, as Spain viewed the Africans as property, that country interpreted the proceedings as being a violation of their 1795 trade treaty with the United States. The cargo was being ruled on in federal court, on salvage claims. The Spanish traders were being tried in Connecticut, on state charges. The state proceedings were not subject to federal jurisdiction, and the President could not interfere with the judiciary process in the federal salvage case, which included the abductees. The federal judge ruled in favor of the Africans, and the case went to the Supreme Court on appeal. John Quincy Adams presented the defense, and argued on grounds of American ideals. He argued that the taking away of the equal rights of Africans did not align with the intent of the trade treaty, and that the ruling on the freedom of the Africans was a test of the "ideals [America] espoused abroad."[47] The Africans were freed and returned to their country. The Supreme Court ruling was heavily disfavored by the southern states, and increased domestic tensions regarding slavery in general. This case demonstrates the

---

[46] U.S. Department of State, Office of the Historian, "Milestones: 1830–1860, The Oregon Territory, 1846," (n.d.), http://history.state.gov/milestones/1830–1860/OregonTerritory.

[47] U.S. Department of State, Office of the Historian, "Milestones: 1830–1860, The Amistad Case," (n.d.), http://history.state.gov/milestones/1830–1860/Amistad.

juxtaposition of state with federal, legal with moral, and domestic with foreign influences, and how the geographic border first intersected with them all in U.S. history.

C.   THE SOUTH

Looking southward, southwestern expansion of the United States added further complexity and influence of the national borders. The growth of the Transcontinental Railroad drove much of the southwest border expansion effort. The railroad expanded viability of settlements, extended the reach and speed of trade, and would later lead to growth of many new forms of manufacturing (e.g., steel mills, coal mining, assembly lines). These new forms of industry in turn created newer domestic implications, such as urbanization, labor rights, child welfare, and pollution. The limited view of the new rail transportation industry was that it presented an opportunity for more profit, territory, and trade. Acquiring the land needed to construct it was the primary objective of southwest expansion.

One year before the United States negotiated the Webster-Ashburton Treaty with Great Britain to the north, it annexed the Republic of Texas. The United States had attempted to annex the Republic in 1836, after it had won its independence from Mexico; however, this move was met with a threat of war. To avoid another costly war, the United States and the Republic of Texas opted to delay annexation, but maintained diplomatic relations for the next nine years.

In 1845, with a budget surplus as a result of USCS duty collections, and a growing cosmic ideology referred to as "manifest destiny," the United States signed the Treaty of Annexation; an offensive maneuver upon Mexico. In response, as anticipated, Mexico severed diplomatic relations and declared war on the United States. The Mexican-American War lasted three years, and ended in 1848 with the signing of the Treaty of Guadalupe-Hidalgo.[48]

U.S. boundary objectives added a new dynamic to U.S. foreign policy during this period. Driven by goals associated with trade and revenue, along with an almost religious

---

[48] U.S. Department of State, Office of the Historian, "Milestones: 1830–1860, Annexation of Texas," (n.d.), http://history.state.gov/milestones/1830–1860/TexasAnnexation.

ideology of destiny, the United States was now willing to go to war with established nations for the purpose of expansion. Starting from 1776, with an objective of unmolested colonial trade, to 1848, inciting war with an objective of expanding trade routes, the shift of what borders were seen to serve would have global implications for years to come.

D.   THE CIVIL WAR

Just 22 years after the Supreme Court ruling on the Amistad case, 11 states submitted their notices of succession from the Union. These 11 states formed the Confederate States of America supported primarily by foreign finance and supply. The Confederacy leveraged their supply of cotton exports to garner the foreign support. Both the cotton exports and the imports of foreign support were transferred via southern seaports ports of entry. The border became a critical supply line for the survivability of the ceded states. The Union, in turn, blockaded the southern seaports in an attempt to sever the supply chain, and stall the confederate economy. Four years later, at the end of the Civil War, the southern economy was indeed in total collapse. In addition to the Union instituting seaport blockades, it also maneuvered diplomatic powers to encourage other European nations not to provide aid to the south. Through the events of the succession and subsequent Civil War, borders no longer simply regions for revenue, expansion, trade, or aid exchange. They became a tool for manipulation of the land (and the government on that land), a tool of domestic and foreign political influence and sanction.[49]

E.   GOING GLOBAL

The evolution of border dynamics was not constrained to the North American continent. The United States, with its vast naval fleet (a product of the arms race with Great Britain on the northern border), extended its reach throughout the Pacific. Colonizing new territories forms an extension of national borders, including maritime,

---

[49] U.S. Department of State, Office of the Historian, "Milestones: 1861–1865, The Civil War and International Diplomacy," (n.d.), http://history.state.gov/milestones/1861–1865.

and later, air borders. A nation has control over the lands, resources, and people of their colonies; hence, expansion efforts moved beyond the continent towards China and the Philippines, among others.

Motivated by the appeal of further profits (and national revenue) by expanding trade markets, the United States entered into the Pacific region. Although it had been trading with China since 1784, a formal bilateral trade treaty was not signed until 1844. The Treaty of Wangxia allowed for the establishment of diplomatic and trade outposts to be located on Chinese land.

The First Opium War (1839–1842) between Great Britain and China marked the beginning of U.S. engagements in transnational drug issues. Following the lead of the British, U.S. merchants discovered and capitalized on the profits to be made from opium, and imported the drug into the United States. Opium, combined with an increased domestic demand for Chinese products (porcelain, tea, furniture and silks) altered the balance of trade with China. The United States had an established trade relationship with China since 1784. Initially, the United States exported more goods to China than imports received in return. Along with improved border and trade efficiencies, and the introduction of opium to the population, domestic demand led to a reversal of trade flow; the United States then imported more goods from China than it exported to China in return. This imbalance led to financial dependencies that exist to this day. The cross-border drug issue also led to evolutions of U.S. citizenry protection abroad. The United States agreed with China that any American caught smuggling opium, or found to be involved in the illicit trade some other way, would be tried and sentenced under Chinese law. The United States, however, would retain the right to carry out the sentence upon the accused.[50]

Beyond China, expansion of the U.S. presence into the Pacific region marked yet another extension of national boundaries. The Philippine Islands were strategically targeted for colonization, no longer just for resources, trade, and diplomatic influence, but

---

[50] U.S. Department of State, Office of the Historian, "Milestones: 1830–1860, The First Opium War," (n.d.), http://history.state.gov/milestones/1830–1860/China1.

also for military expansion.[51] The perception of borders now encompassed both economic and military interests. This mutation led to significantly broader political and trade-based engagements, both at the local and regional levels. These developments guided U.S. domestic and foreign policies well into the new century.

F.   THE 20TH CENTURY

Borders had evolved markedly from 1776 to the 1900s. The concept of boundary lines emerged from what was once a frontier concept, to a trade region, revenue collection point, ideological control (manifest destiny), political control, foreign influence, and military expansion. These goals merged into a kaleidoscope of national interests significantly expanding the realm of global influence and U.S. diplomacy.

As the United States settled the remaining territories on the mainland throughout the 18th and 19th centuries, it also expanded its reach into the global sphere. The United States felt confident to continue expanding its international expansion efforts into the first part of the 20th century. Following successful colonization and trade in the Pacific region, the United States proceeded to enhance its "sphere of influence" (expanding markets, colonies, and control throughout Western Hemisphere). A new dynamic was created under the presidency of Woodrow Wilson. The national boundaries, economy, domestic growth, and foreign policy had all centered around trade through the borders. Economic interests were the pillars of all domestic and foreign policy efforts. In fact, many, if not most, foreign policies evolved from domestic border dynamics. President Wilson had a new objective; to use foreign policy as a platform for defining and spreading ideals, morality, and democracy.[52] This objective formed the 20th century version of "manifest destiny," and would influence both domestic and foreign policies throughout the century to come.

From a border perspective, this strategic shift complicated the landscape greatly. It created a pluralistic purpose, in which the domestic borders required a focus on

---

[51] U.S. Department of State, Office of the Historian, "Milestones: 1830–1860, Maritime Expansion Across Pacific," (n.d.), http://history.state.gov/milestones/1830–1860/PacificExpansion.

[52] U.S. Department of State, Office of the Historian, "Milestones: 1914–1920, Wilsonian Diplomacy," (n.d.), http://history.state.gov/milestones/1914–1920.

economic interests to continue functioning as they had been designed, yet exportation of goods, ideas, values and the like were to be framed by an esoteric ideology. Those exportations, however, were dependent upon the volume of import flows. Further complicating the policy landscape, the Executive Office was asking the American people to adopt the ideologies that would be put forth on the foreign front. This juxtaposition of ideology and economy would later prove to be the root issue of present day immigration reform and border security debates, economic interests vs. ideological values.

The remainder of the 20th century continued expansion of foreign affairs and trade interests. Even with the short-duration U.S. isolationist position around the world wars, necessity required continued economic and military growth, and broadened foreign involvement. Private investment continued to influence U.S. engagement abroad, and the rise of fascism and communism anchored the Wilsonian objective of ideologically defined foreign policy.

History has shown U.S. border interests drove foreign involvement, and in turn, drove the domestic economy. The objective of the border had been almost exclusively economic by nature. The U.S. border served also another purpose that had not been fully capitalized on up until the 20th century. That purpose related not to management of goods that crossed the border, but to the people who crossed and stayed. Immigration began as a coveted and marketed industry to draw settlers to populate the fledgling nation-state, later evolving towards restrictions and controls in response to racism, labor disputes, health issues, and ideological threats to the governing body.

G.   THE ISSUE OF PEOPLE

From 1882 forward, a new dominant interest arose and was found to be a powerful influence on economy, politics, and foreign relations. Labor and race interconnected with both economic and cultural mores since the earliest days of the United States. These interconnections were what led to the formalization of immigration, a new tier of border dynamics. The history to follow is not intended to be a full

accounting of naturalization and immigration laws and issues. The objective of this section is to familiarize the reader briefly with when and why the border became a central issue in the topic of immigration.

At first, immigration and naturalization laws limited specific races, ethnicities, or nationalities from entering the United States; later evolving to incorporate more complex concerns related to education, criminal history, political affiliation, burden on the state, and loyalties, among others. Of note, states determined how they would regulate immigration into their territories up until 1875, when, by ruling of the Supreme Court, it was deemed a federal responsibility.[53]

Numerous naturalization acts, laws, and restrictions were enacted before any comprehensive immigration laws came about. The primary goal of the United States, from 1790 to 1882, was to restrict citizenship. With citizenship came the opportunity to acquire land and wealth, vote, and compete in labor markets. Also with citizenship came cultural influence and the possibilities of heterogeneity, and risk to public value changes that diversity would likely create. Unlike claims for citizenship, immigration was very much desired in the early years of the nation. Increases in the population were seen as helpful in settling the west, and provided a larger (cheaper) labor pool for expanding railroad, coal, textile, and steel industries (i.e., export trade).

The naturalization, however, of diverse races, ethnicities, and nationalities was seen as a disruption to the social identity and political stability of American society. This disruption was seen to occur from a society and economy that was, at the time, facing massive influxes of poor laborers as a result of global economic, political, and social unrest.

In 1819, Congress required the Secretary of State to report on the number of immigrants arriving in the United States. To do this, shipmasters were required to provide USCS a manifest of all aliens on board their ship, along with their cargo manifests.

---

[53] U.S. Customs and Border Protection, "U.S. Immigration and Naturalization Service—Populating a Nation: A History of Immigration and Naturalization," (n.d.), http://www.cbp.gov/xp/cgov/about/history /legacy/ins_history.xml.

Controls, restrictions, and admissions processes were not yet in place. People could move freely into and out of the country. The manifests simply served as a reporting and survey tool.

Mass migrations into the United States from Europe started in the 1840s, as a direct result of famines and political revolutions abroad. By 1862, during the Civil War, European immigration escalated in response to the Homestead Act, which was a law granting up to 160 acres to anyone who wanted to settle in the west. The following year, in 1863, European immigrants rioted in New York City in response to the Union draft. This riot was the first evidence of political shifts occurring as a result of, what was later found to be, the spread of communist and anarchist view; a spread associated with immigrants and border crossing.

German, Irish, Southern and Eastern European immigrants dominated the cross-border flow during the latter years of the 19th century. Eastern European Jews dominated the immigrant flow through the first two decades of the 20th century. Yet it was the Chinese, the primary laborers (next to the Irish) for the Transcontinental Railroad, who were subject to the first restrictive measures. The 1882 Chinese Exclusion Act denied any further Chinese immigrants from entering the United States, for a period of 10 years. The law would be renewed twice; the second without an end date.

That same year, the Immigration Act of 1882 was ratified. This law created ineligible classes of immigrants, and required that all arriving immigrants at seaports pay a tax. The economics of border revenue collection had been extended to the growing immigration inflows, and helped the Union pay for the Civil War. Aside from the Chinese and a few minor ineligible classes (e.g., "lunatics"), immigration of people was still unrestricted. Manifests of names were provided, taxes were paid (50 cents), and movement could continue unabated.

During the late 19th and early 20th centuries, revolutions were occurring in a number of European countries, communism was on the rise, and Germany and Ireland were experiencing crop failures and famine. Communism and anarchy were spreading abroad in response to the brutalities inflicted upon Southern and Eastern Europeans.

These political beliefs came to the United States with the immigrants that held them. As the U.S. trade, manufacturing, and ideological expansion objectives continued, populations abroad began to see the United States as an opportunity to escape war, poverty, unrest, and hunger. The very policies that used the borders to expand foreign influence, and capitalize on wider trade markets, led to the industrial revolution, a revolution that created a multitude of social, health, and political issues. Issues which, when combined with the immigration of millions escaping social, economic, and political issues abroad, resulted in chaos.

Many dynamic issues contributed to the chaos: aftereffects of slavery, unequal status of women, wars, a depression, environmental catastrophes (e.g., Oklahoma dustbowl), unemployment, drugs (e.g., Chinese opium), contagious disease, the gold rush, and the rise of unions. It was in this context that immigration and national security collectively became associated with U.S. borders.

It was in 1891 when the dynamics of immigration began getting more complex. Restrictions against contagious diseases, moral turpitude, and polygamy entered the frame, and the first federal immigration office was established.[54] When an Eastern European anarchist shot President McKinley in 1901, immigration restrictions were extended to all anarchists and political extremists. The Expatriation Act, a law that stripped women of their U.S. citizenship if they married a foreigner, was ratified in 1907. It was during this time period that immigration became associated with social value liabilities.

Also in 1907, the United States and Japan entered into an informal "Gentleman's Agreement," so that Japan would restrict their number of U.S.-bound emigrants if the United States would address the discrimination being experienced by Japanese in California. The Japanese would later perceive the Immigration Act of 1924, which excluded all Asians from immigrating to the United States, as a violation of this agreement, and created a strain on diplomatic relations up to the time of Pearl Harbor.

---

[54] The Office of the Superintendent of Immigration fell under the U.S. Department of Treasury. Up to 1891, the U.S. Customs Service managed the immigrant taxes, ship manifests, and Chinese exclusion requirements.

These events illustrate how political unrest, social influence, and foreign relations intersect at the border, much like with the 1839 *La Amistad* case. In less than 100 years, this intersection combined with technological growth, evolved past diplomatic and legal debate; it led to attack and engagement in a world war.

H.   SUMMARY

The concept of boundary lines emerged from what was once a frontier concept, and with that emergence came trade, ideology (manifest destiny), political control, foreign influence, and military expansion. These goals merged into a kaleidoscope of national interests that hinge on borders and concepts of sovereignty. Borders serve as a method to pay debt (revenue collection), a means to expand transportation, settlement, and power (rail road, manifest destiny, military positioning), a hub through which to transfer goods (trade corridors), and a source for cultural exchange (regional intersections). History has demonstrated the vast interconnections and interdependencies boundaries serve.

As domestic and world events and policies began shifting the concept of borders, a new socio-political and economic perspective emerged, threat. Borders, in form and function, are more than a line separating countries. They serve as areas, regions, corridors, frontiers, and political and cultural interfaces. They are also economic hubs, influence foreign diplomacy, reflect values (and fears), and can be used to start wars. These dynamics contribute to the complexity that is border security, and will be considered in development of the conceptual model that is to come later in this thesis. The next chapter explores some of the perceived threats that border security policies are intended to address.

THIS PAGE INTENTIONALLY LEFT BLANK

IV.   PERCEPTION OF THREATS

> After having made their domestic animals dumb and having carefully prevented these quiet creatures from daring to take any step beyond the lead-strings to which they have fastened them, these guardians then show them the danger which threatens them, should they attempt to walk alone. Now this danger is not really so very great; for they would presumably learn to walk after some stumbling. However, an example of this kind intimidates and frightens people out of all further attempts.[55]

> –Immanuel Kant

The previous chapters described the inconsistent, multi-faceted, and ambiguous framework within which borders are understood, and what objective(s) borders themselves have been seen to serve. As a consequence, policies associated with securing borders have been (and are) equally inconsistent and complex. It remains unclear how a consistent approach to identifying threats that jeopardize borders could be possible, without understanding the very nature of borders. Similarly, clear definitions of "security" and "threat" are necessary to clearly articulate strategies, and allocate resources based upon community need rather than agenda. This chapter looks to explore some open source concepts of threats, to discuss some contradictions briefly in the understanding of what constitutes a threat and limitations to the coherence of border security that these issues create. The objective of this exploration is simply to call into question the common assumptions of what a threat is understood to be.

A.   HOW BORDER SECURITY IS CURRENTLY DEFENDED

Contemporary border security policies are control-oriented, targeting one or more activity or event-oriented threats, e.g., drug trafficking, illegal immigration, trade

---

[55] Thomas K. Abbott, trans., "Answer to the Question: What is Enlightenment?" in *Basic Writings of Kant*, ed. Allen W. Wood (New York: The Modern Library, 2001), 135.

facilitation, terrorism.[56] Rarely do these policies define "security," "threat," or "border."[57] Although "security" remains an undefined, broad, and highly complex concept, the assumption is that by expanding control-centric programs, such as the border fence, surveillance technology, and more law enforcement personnel, it will be reached. Some border security issues could indeed be addressed through efficient, technologically based control standards. Improving the mechanical flow of traffic through a port of entry (POE), for example, or installing ballistic glass on facilities to mitigate effects of bomb blasts. Actors, networks of individuals, and groups, however, perpetrate activity-oriented threats. The social nature of these networks renders threat activities unpredictable, due to their adaptability.[58] Furthermore, the cause-effect relationship behind border threat activities cannot be known until after an event occurs.[59] Drugs can be interdicted through surveillance and screening, but whether those drugs have a direct connection to transnational terrorist organizations (TTOs) cannot be determined until after a seizure is made. Drugs could be produced and distributed by a local, independent operator (e.g., homemade ecstasy or garage-based hydroponic marijuana). On the other hand, they could be a product of a global criminal network, with connections to human

---

[56] U.S. Customs and Border Protection, "Fiscal Year 2009–2014 Strategic Plan," 2009, http://www.cbp.gov/linkhandler/cgov/about/mission/strategic_plans/strategic_plan_09_14.ctt/strategic_plan_09_14.pdf; U.S. Department of Homeland Security, "Written Testimony of U.S. Coast Guard Deputy for Operations Policy & Capabilities Rear Admiral William Lee for a House Committee on Homeland Security, Subcommittee on Border and Maritime Security," February 26, 2013, http://www.dhs.gov/news/2013/02/26/written-testimony-us-customs-and-border-protection-house-committee-homeland-security; House Committee on Homeland Security, Subcommittee on Investigations, *A Line in the Sand: Confronting the Threat at the Southwest Border* (Washington, DC: 2006), http://www.house.gov/sites/members/tx10_mccaul/pdf/Investigaions-Border-Report.pdf; U.S. Department of Homeland Security, *Strategic Plan for Fiscal Years 2012–2016* (Washington, DC: 2012), https://www.dhs.gov/sites/default/files/publications/DHS%20Strategic%20Plan.pdf; Marc R. Rosenblum, *Border Security: Immigration Enforcement Between Ports of Entry*, CRS Report R42138 (Washington, DC: Library of Congress, Congressional Research Service, 2012), http://fpc.state.gov/documents/organization/180681.pdf.

[57] The recognition of the absence of this clarification in general throughout security related debates, draws upon the discussion put forth in David A. Baldwin, "The Concept of Security," *Review of International Studies* no. 23 (1997): 5–26.

[58] Anand Desai, "Adaptive Complex Enterprises," *Communications of the ACM-Adaptive Complex Enterprises*, Special Issue 48, no. 5 (May 2005): 32–35.

[59] For a discussion of coherence and complexity, see Cynthia F. Kurtz and David J. Snowden, "The New Dynamics of Strategy: Sense-Making in a Complex and Complicated World," *IBM Systems Journal* 42, no. 3 (2003): 462–483.

trafficking, weapons, and terrorism. The cause can be known only retrospectively; thus, placing the source of border threats in the realm of the complex, and inherently uncontrollable.[60]

The efficacies of border security policies are publicly debated through value-based and/or empirical arguments as opposed to complex social dynamics. The value-based positions argue costs of culture, individual rights, the Constitution, or classifications of people or groups as good or bad. The empirical arguments, alternatively, hinge on statistical analysis of crimes, rates, budget costs, industry profit, and judicial or legislative mandates. With the exception of some recent terrorism research,[61] and transnational criminal organizations (TCOs),[62] very little has been attempted to understand the geographical, economic, or sociopolitical phenomena driving the behaviors of the actors behind border threat activities. Cartels, criminal traffickers, and illegal immigrants are labeled as dangers to the homeland, in the same manner terrorists have been generically. Rather than exploring the environments influencing these subjects, arguments for border security have perpetuated these subjects as dangers to the nation that can be controlled. Much like the early assumptions of terrorists,[63] the tactics and intents of criminal organizations and actors are generally assumed to be that of strategic choice; that is, rational and reasoned power struggles, thus easily controlled

---

[60] For a discussion of how the Cynefin Framework categories of 'known, knowable, chaotic, disordered, and complex' require differing strategic approaches to Homeland Security, see Christopher Bellavita, "Changing Homeland Security: Shape Patterns, Not Programs," *Homeland Security Digital Library*, October 2006.

[61] See David W. Brannan et al., "Talking to "Terrorists:" Towards an Independent Analytical Framework for the Study of Violent Substate Activism," *Studies in Conflict & Terrorism* (Fife, Scotland: Taylor & Francis, 2000) 24, no. 4, 6; Angela Dalton and Victor Asal, "Is It Ideology or Desperation: Why Do Organizations Deploy Women in Violent Terrorist Attacks?," *Studies In Conflict & Terrorism* 34, no. 10 (2011): 802–819); James J. Forest, "Kidnapping by Terrorist Groups, 1970–2010: Is Ideological Orientation Relevant?," *Crime & Delinquency* 58, no. 5 (September 2012): 769–797; Megan K. McBride, "The Logic of Terrorism: Existential Anxiety, the Search for Meaning, and Terrorist Ideologies," *Terrorism & Political Violence* 23, no. 4 (2011): 560–581.

[62] Ben Riley and Kathleen Kiernan, eds., "The "New" Face of Transnational Crime Organizations (TCOs): A Geopolitical Perspective and Implications to U.S. National Security," *Kiernan Group Holdings*, March 2013, https://www.hsdl.org/?view&did=733208.

[63] Brannan et al., "Talking to "Terrorists:" Towards an Independent Analytical Framework for the Study of Violent Substate Activism," 6.

through capture or sanction.[64] Dismantle an organizational hierarchy, or apprehend an individual, and the threat ceases to exist. In the case of criminal cross-border activities, dynamics of culture, group behavior, globalization, and sociopolitical pressures (and weaknesses) are generally absent from policy rationale. Consequently, the patterns created by actors (licit and illicit) that directly or indirectly connect to the border domain are vaguely, if at all, understood.

Although borders and the actors interfacing with them are opaque, the Department of Homeland Security (DHS) has, nonetheless, a strategic mission documented to securing the border.[65] In (FY) 2012 alone, DHS requested nearly $2.13 billion specifically for border security.[66] Given the significant costs (qualified and quantified) and CAS dynamics threat activities and programs to contain them produce, it is prudent to understand better how threats are understood.

B.   THE CONCEPT OF THREAT

Variable means can be used to label someone or something a threat. A threat can be a situation or activity that could cause harm.[67] Threats can also be people or things that may cause damage or danger.[68] "Harm" and "could" do not provide the necessary framework by which to determine appropriate resource deployments. Harm is a subjective concept, and the range of probabilities is vast when something "could" happen. Similarly, "situation" or "activities" render an ambiguity such that policy development is

---

[64] Ed Peaco, "Ice Partnering to Fight Crime on a Global Scale," American Board for Certification in Homeland Security, (n.d.), http://www.abchs.com/ihs/SUMMER2012/ihs_articles_cover.php; U.S. Department of Justice, *Statement of Assistant Attorney General Lanny A. Breuer Before the Senate Judiciary Subcommittee on Crime and Terrorism*, (November 1, 2011), http://www.justice.gov/criminal/pr/testimony/2011/crm-testimony-111101.html; U.S. Department of Treasury, "Treasury Sanctions Latin American Criminal Organization," Press Release, October 11, 2012, http://www.treasury.gov/press-center/press-releases/Pages/tg1733.aspx.

[65] U.S. Department of Homeland Security, "Secure and Manage Our Borders," (n.d.), http://www.dhs.gov/secure-and-manage-borders.

[66] U.S. Department of Homeland Security, "Budget-In-Brief: Fiscal Year 2012," (n.d.), 9–10, http://www.dhs.gov/xlibrary/assets/budget-bib-fy2012.pdf.

[67] Macmillandictionary.com," "Threat," (n.d.), http://www.macmillandictionary.com/us/dictionary/american/threat.

[68] "Threat," Oxforddictionaries.com, accessed September 5, 2013, http://www.oxforddictionaries.com/us/definition/American_english/threat?q=threat.

left to personal or organizational interpretation. Even more subjectivity exists with "damage" or "danger." By what measure are these understood? In the context of border security, representatives in Congress broadly posit defense against anything that threatens "freedom, security, and our way of life."[69] Evidenced by centuries of statecraft, wars, and independence struggles, this nebulous and unsubstantiated concept is itself a threat. Throughout policy and literature, attention is predominantly directed towards programs and grant frameworks by which resources are to be distributed or trained to manage threats. Very little, if any, discussion exists questioning the very assumption of what constitutes a threat, security, or boundaries of security measures. This gap does not enable the author to compare or contrast threat definitions clearly, although exploring differing approaches to threat management may draw some insights.

1.   One Perspective of Managing Threats: Preparedness

The U.S. Presidential Policy Directive 8 (PPD-8) calls for capabilities to prepare for national level threats. The PPD-8 limits a threat to an event, excluding people and things from consideration. National level threats are further described as either: 1) acts of terrorism, 2) cyber attacks (terrorism + hostile nation), 3) pandemics (naturally occurring + engineered), and 4) natural disasters. The threats are separated as though they are unique and distinct from one another. PPD-8 does not take into consideration that behavioral patterns can evolve and adapt, which can lead to convergence of multiple events and unknown consequences. Rather, the policy is narrowly focused on singular events of which cause and consequence are known.

In support of PPD-8, the DHS developed the Strategic National Risk Assessment (SNRA), as shown in Table 1. This assessment created thresholds to measure when an event reaches the national level, and categorized them into "groups" and "types." The SNRA identified three threat groups and a total of 23 threat types. Natural disasters are detailed with nine types, technological and accidental threats have four types, and

---

69 House Committee on Homeland Security, "McCaul Border Security Guiding Principles and Opening Statement on Hearing: A New Perspective on Threats to the Homeland," (n.d.), http://homeland.house.gov/press-release/mccaul-border-security-guiding-principles-and-opening-statement-hearing-new.

adversarial and human caused threats have 10 types.[70] "Hazard," "risk," and "threat" are interchangeably applied to describe issues detrimental to domestic security, but the assessment is clear not to include "enduring" or "steady-state" activities, such as drug trafficking and intellectual property violations.[71] In short, the DHS perceives a threat as a determinate event, with known cause and effect.

Threat Group		Threat Types	National Event Designation Thresholds
1	Natural Hazards	9	$100M direct loss caused by nature (flood, earthquake, hurricane, wildfire) - Foot and mouth in domestic livestock 25% gross clinical attack rate caused by pandemic influenza 50 ft tsunami on Pacific Coast - Lava flows, ash, smoke in Pacific NW
2	Accidental Hazards	4	100+ hospitalizations and multi-State response caused by biological agent 1+ fatality caused by dam failure 1+ fatality caused by toxic chemical release - Radiation release caused by reactor core
3	Human Caused Hazards	10	- Non-state actors only 1+ fatality *and* assault tactics - Any airline crash into physical target - Acquire, weaponize *and* release CBRN - Acquire *or* create radioactive material - Deploy IED *and* 1+ fatality or injury $1B direct loss due to data exploitation $1M direct loss *or* 1+ fatality (cyber vector)

Table 1.   National Threats Aligned with PPD-8.[72]

Per the quantitative thresholds noted in the SNRA, a national threat generally equates to method+death+direct cost of $1M to $1B. The methodology of classification, categorization, and measurement is inconsistent with the stated objective of the PPD-8, which again is preparation. Preparation assumes consequences are predictable. Given the interconnected and interdependent trade, social, cultural, political, and financial systems created over the past century, the complexity of costs resulting from a national threat

---

[70] U.S. Department of Homeland Security, "The Strategic National Risk Assessment in Support of PPD 8: A Comprehensive Risk-Based Approach Toward a Secure and Resilient Nation," 2011, http://www.dhs.gov/xlibrary/assets/rma-strategic-national-risk-assessment-ppd8.pdf, 2–3.

[71] Ibid., 6.

[72] Ibid., adapted from SNRA chart on 3–4.

cannot be known beforehand. Issues that can create a casualty (injury or death) and/or economic loss can have multiple actors (state and non-state), multiple effects (direct, indirect, domestic, foreign), and interdependent yet disparate "causes." For example, financial market securitization can create foreign investment that creates interdependency between domestic employment rates and foreign relations.[73] Foreign collapse could result in domestic unemployment. Another example includes free trade agreements leading to exploitation of foreign government instability by criminal organizations, which in turn, creates excessive border violence.[74] The girth of social, political, economic and diplomatic effects of unemployment rates and violence span well beyond a single threat event.[75,76] Furthermore, the SNRA does not incorporate a methodology for determining the likelihood or probability that a threat would occur; only costs after the fact. It follows then, that the DHS scopes preparation within narrow confines of emergency response: readiness only for known issues. Preparation is not conceived as the building of readiness capabilities of foresight, adaptation, or pre-event intervention. Therefore, "threat" from a preparedness perspective, is "right of boom," constrained only to phenomena that standardized, technical fixes can address.

[73] Hyman P. Minsky, "Global Consequences of Financial Deregulation," *Hyman P. Minsky Archive,* Paper 378 (October 2, 1986), 39, 43–44, http://digitalcommons.bard.edu/hm_archive/378.

[74] David J. Danelo, *Toward A U.S.-Mexico Security Strategy: The Geopolitics of Northern Mexico and the Implications for U.S. Policy* (Philadelphia, PA: Foreign Policy Research Institute, 2011), 6, 15, 17–18, https://www.fpri.org/docs/Toward_a_US_Mexico_Security_Strategy_Danelo.pdf.

[75] Marketplace, "The Breakdown: The Ripple Effects of Unemployment," Marketplace Podcast, Hosted by Kai Ryssdal, September 17, 2011, http://www.marketplace.org/topics/business/breakdown /breakdown-ripple-effects-unemployment.

[76] Lee Maril, "The Border Fear Index: How to Measure Border Security," *Homeland Security Newswire*, December 16, 2011, http://www.homelandsecuritynewswire.com/dr20111216-the-border-fear-index-how-to-measure-border-security.

2. A Second Perspective of Managing Threats: Prevention

With respect to the border, intellectual property (IP) theft, smuggling, and terrorism are recognized as border threats.[77] These threats are understood as activities that given their recurring nature require protectionist enforcement strategies, as opposed to preparedness.[78] As noted in the SNRA, the DHS conceives these threats as "enduring" (without end), and thus, not within the realm of preparedness capability building. This distinction is important. Preparedness is a proactive posture, intended to ensure effective response. The concept of preparedness infers that the consequences of a threat are understood and manageable; that the nation, economy, and people can effectively recover from the impact, even though the probability of impact may not be unknown.[79] Contrarily, protectionism intuits that consequences of a threat are not entirely understood, or if they were, they would be so egregious that no amount of preparation could effectively manage them; recovery would be unlikely.

Protection, thus, is utilized as a preventive security posture; a posture that can create unintended consequences as illustrated in Chapter II.[80] The assumption is that the irrevocable effects of these threats crossing the geo-political border warrant a defensive strategy. Prevent IP theft, drug trafficking, terrorism and illegal immigration from entering the United States to protect the nation from assumedly irrevocable consequences. An illegal immigrant, as an example, would be seen as having a high probability of causing physical death or injury to U.S. citizens. On the other hand, cross-border transfer of illicit IP would be seen as having a high probability of creating

---

[77] U.S. Immigration and Customs Enforcement, "Statement of James A. Dinkins, Hearing on Border Security Threats to the Homeland: DHS's Response to Innovative Tactics and Techniques, Before the U.S. House of Representatives, Committee on Homeland Security, Subcommittee on Border and Maritime Security," June 19, 2012, http://www.ice.gov/doclib/news/library/speeches/120619dinkins.pdf.

[78] Rama Laksmi, "Indian Information Technology Firms Say Border Security Bill Is Protectionist," *Washington Post*, August 6, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/08/06/AR2010080604068.html.

[79] Jeannette Sutton and Kathleen Tierney, "Disaster Preparedness: Concepts, Guidance, and Research," Report prepared for the Fritz Institute Assessing Disaster Preparedness Conference, Sebastopol, CA., November 3–4, 2006, 3, http://www.fritzinstitute.org/pdfs/whitepaper/disasterpreparedness-concepts.pdf.

[80] Kiran Moodley, "WTO Warns of Trade Slowdown Due to Protectionism," *CNBC*, reported by Steve Sedgwick, September 6, 2013, http://www.cnbc.com/id/101014240.

irreparable economic damage. By this logic, it would stand to reason the U.S. government perceives border security as a zero-sum, control effort; a defensive and reactive platform from which tactics must be neutralized, otherwise, un-qualified "freedom, security, and way of life'' will be destroyed.

Yet social systems are adaptive, and so can be their activities. A threat actor will adapt to control efforts, which result in the emergence of new threat activities. Construction of elaborate underground tunnel networks, for instance, in response to installation of a border fence. Although control and regulation focus on threat activities, these measures do not prevent actors from adapting. In fact, efforts intended to prevent threats and protect the United States, reinforce adversarial adaptation. Is the threat truly the process and products of smuggling, IP theft, terrorism, and trade, or is it the ideologies of the actors behind these activities? Can control and protection measures themselves be perceived as threats to "freedom, security, and way of life"?

3.   The Concept of Measuring Security

In a recent testimony, Chief Michael Fisher, Customs and Border Protection (CBP), offered Congress a range of interpretations of the phrase "border security," to include subjective concepts like "living free from fear," fluid cross-border business, rapid cross-border transit, situational awareness, and response capabilities.[81] These concepts necessarily reflect the growing complexity of managing a globalized and economically integrated landscape, but continue to skirt defining threats or describing the dynamics that form them. Instead, Fisher falls back on data as indicators of security, such as number of personnel, miles of fence, number of home sales, job growth, and tourism rates. The economic indicators Fisher referred to were going to be statistics used in the now shelved Border Condition Index, but were deemed by former DHS Secretary

---

[81] U.S. Department of Homeland Security, "Written testimony of CBP Border Patrol Chief Michael Fisher and Office of Field Operations Assistant Commissioner David Murphy for a House Committee on Oversight and Government Reform, Subcommittee on National Security Hearing titled "Border Security Oversight: Identifying and Responding to Current Threats," June 27, 2013, http://www.dhs.gov/news/2013/06/27/written-testimony-cbp-house-oversight-and-government-reform-subcommittee-national.

Napolitano as "a very difficult thing to do in any kind of statistically significant way."[82] What appears to be happening is an attempt at defining border security through a form of reverse engineering. These attempts range from revising risk assessment methodologies, developing and re-developing measurements of current enforcement policies, and re-packaging accepted rates (e.g., apprehensions, interdictions, and number of 'partnerships').[83] These efforts do not lend any clarity as to what constitutes a threat, only how to better prioritize bureaucratically accepted ones.

The confusion and ambiguity of what border security is, and how it can be measured, is increasingly debated. Although research demonstrates a growing recognition of economically unintended consequences that can arise from enforcement policies, the concept of threats requiring border security remain unchallenged. For example, Henry Willis et al., in "Measuring the Effectiveness of Border Security Between Ports-Of-Entry," argues that functional capabilities are the best measurement of effectiveness, yet tie those capabilities back to the prevention of threats. The threats Willis et al. describe are those firmly planted in existing policy: 1) flow of terrorists and their weapons, 2) drug smuggling, and 3) illegal migration.[84] In other words, measurement is simply a re-packaging of the status quo. The number of illegal immigrants apprehended and the pounds or kilograms of narcotics seized remain central to determining security levels. Josiah Heyman argues that the current view of border control is "misplaced and counterproductive."[85] He suggests that threats to border security should be limited to addressing violent, physical harm to civilians. Addressing this harm, Heyman continues, should be balanced with an assessment as to whether a) probability of harm is likely, and

---

[82] Brian Beutler, "Napolitano: Border Security Trigger 'Not the Way To Go' In Immigration Reform," *TPMDC*, March 26, 2013, http://tpmdc.talkingpointsmemo.com/2013/03/napolitano-border-security-trigger-not-the-way-to-go-in-immigration-reform.php.

[83] Joseph Garcia, "On the U.S.-Mexico Border, What Does 'Secure' Mean?," *azcentral.com*, July 28, 2013, http://www.azcentral.com/opinions/articles/20130726us-mexican-border-secure-mean.html.

[84] Henry H. Willis et al., "Measuring the Effectiveness of Border Security Between Ports-of-Entry," RAND Technical Report, 2010, 4, http://www.borders.arizona.edu/cms/sites/default/files/RAND_TR837-FINAL%20REPORT.pdf.

[85] Josiah McC. Heyman, *Guns, Drugs, and Money: Tackling the Real Threats to Border Security*, (Washington, DC: American Immigration Council, Immigration Policy Center, 2011), 2, http://www.immigrationpolicy.org/sites/default/files/docs/Heyman_-_Drugs_Guns_and_Money_091211.pdf.

b) public policy and government response would make a difference.[86] Although Marc Rosenblum et al. do not question the premise of the function of border security (keep things and people out), they do take note to mention social, cultural, environmental, and "other impacts" as contributory to public perception of what is threatening.[87] The characteristics of border security are broadening and becoming increasingly complex. So much so, that policy makers have defaulted back to the control paradigm around "people" and "things."

a. People

Although the debate continues as to what is and should be the function of border security, at least an agreement appears to exist that the concept of security equates to protection from a threat. The disagreement erupts from the context and assumptions of what those threats consist of, how severe they are, and what trade-offs are acceptable in the name of protection and prevention. Differing views of security create differing views of threats, and methods to protect against threats. These differences are at the heart of security debates.

Research also demonstrates threats are thought of as actors (or group of actors), as opposed to just an activity or event. The concept of people or groups of people as threats themselves complicates the protectionist methodology described earlier. In lieu of neutralizing specific activities as the objective of border security, actors, organizations, and networks of people are seen as the threat requiring mitigation. This dichotomy of perspective creates inconsistent approaches to threat assessment, and innumerable policy implications, such as indefinite detention, assassination, and retraction of civil liberties, for example. Whether a border threat is an activity or person is debatable, yet critical to understanding border CAS dynamics.

If the real threat were indeed the motivations of the people who engage in activities, and not the activities themselves, the current border threat mitigation strategy

---

[86] McC. Heyman, *Guns, Drugs, and Money: Tackling the Real Threats to Border Security*, 3.

[87] Marc C. Rosenblum, Jerome P. Bjelopera, and Kristen M. Finklea, *Border Security: Understanding Threats at U.S. Borders*, CRS Report R42969 (Washington, DC: Library of Congress, Congressional Research Service, 2013), 5, http://trac.syr.edu/immigration/library/P7167.pdf.

would be wholly misaligned. Human intentions are a complex mix of social, psychological, and cultural factors, i.e., social and individual identities and behaviors. Whether adversarial intentions materialize as profit, revenue, power, vengeance, or survival-driven motives, a network of influences upon the social and individual contexts of the actor(s) is what catalyzed the intention in the first place. If protectionism is about neutralizing a threat before it can create an unmanageable effect; and a threat is seen as a personal motive, the influences molding the motive would be the origin of the threat. Prevention, thus, would mean neutralizing the influences, not people.

For example, it is often cited that terrorism is driven by ideology. Terrorist acts themselves are intended to further the objectives of the ideology. An act of terrorism itself is not the threat; the threat is the influence contributing to the ideology driving the radicalization of people to commit the act. Furthermore, ideology must, by its very nature of human origin, include the feedback mechanisms and behaviors that keep the ideology alive. Simply stated, whatever is threatening an individual or social identity is what maintains an ideology. Therefore, if ideology drives terrorist radicalization, so too must be the contextual insights of the actors identities. Conceivably, by mitigating the perceptions of threat to identity, terrorism might be prevented. How then, does this concept relate to border security?

People, and the social and individual identities that drive them, are not border-centric; they are community and environmentally housed. Therefore, the border as a preventive measure, as described earlier, does not fit with the terrorist threat. The ideology would already be formed by the time the border entered the scene, and as such, render prevention moot. Instead, the border would serve as an information highway of sorts, a transfer point of ideas crossing from one community to another. The transfer would not necessarily require physical crossing. Ideas and ideology can be maintained and strengthened virtually as well. Moreover, in an open, democratic society, sharing of those ideas cannot be prevented. In this respect, the border serves a three-fold purpose: 1) a transfer point for ideas between communities, 2) a surveillance mechanism to observe the people sharing the ideas, and 3) to communicate counter-threat (deterrence) and rigid protectionist preference (e.g., fencing). Although it is beyond the scope of this thesis, it

48

should be noted that deterrence efforts communicated via borders demonstrate a failure to adapt from Cold War strategies to the 21st century network. Deterrence efforts reflect limited insight and comprehension of the contemporary dynamics behind ideological threats. Whether the actor named as a "threat" is a TCO, transnational terrorist organization (TTO), or illegal immigrant, the dynamics between social and individual identities, ideologies, and intentions apply. If people are the threat, it is as a result of behavioral dynamics, whether understood or not. Nonetheless, border security is officially viewed as the neutralization of an activity and people engaged in those activities.

Although Rosenblum et al. were referring to the public perception of illegal immigration, it widened the view of influences that could affect how "threats" can be applied to other domains, or tribal lands, for example. An alternative perspective of threats to security can be observed by looking at Native American tribes. The treaties that created the northern and southern geo-political land borders, as discussed in Chapter III, bisected a number (not all) of Native American tribal lands. Of those tribes impacted by the boundary lines, contentious border control issues exist associated with tribal sovereignty, right to free passage, and continuity of cultural heritage. These bisections, and the ever-increasing levels of control policies, have created a threat to maintaining their cultures. Certain Native American tribes have, through treaties, been extended rights to move freely across boundary lines. Those freedoms have been progressively restrained since the 1980s, as border controls became stricter as the War on Drugs grew. The Tohono O'odham nation, for instance, have tribal lands in the Sonoran desert spanning southern Arizona into northern Mexico.[88]

The border fence and controls have resulted in a number of negative consequences for the nation. The Tohono O'odham is facing increasing difficulties with travel between villages and sacred sites on both sides of the border, as they are no longer able to attend religious and cultural gatherings freely. As a result of a lack of

---

[88] Joshua J. Tonra, "The Threat of Border Security on Indigenous Free Passage Rights in North America," *Syracuse Journal of International Law & Commerce* 34 (Fall 2006): 247, http://web.ebsco host.com.libproxy.nps.edu/ehost/pdfviewer/pdfviewer?sid=87060d4a-7453–4e9c-b40a-83669d29d438 %40sessionmgr115&vid=5&hid=128.

documentation (due to remoteness, sovereignty, and poverty issues),[89] distance to POEs, and risk of deportation, cross-border attendance has reduced significantly, in turn slowing the passing down of traditional language and culture to the next generation. The only healthcare facility for the nation exists on the U.S. side of the tribal lands, which limits access for the tribal members who live on the Mexican side of the reservation.[90] Another effect has been the "balloon effect" of border enforcement. As cross-border actors shift their routes in response to patrol operations, more migratory and criminal traffic is passing through Tohono O'odham lands, which has strained tribal resources and increased pollution, rescue, body recovery, and crime.[91]

Along the northern border, the Mohawks face similar issues. The Mohawks, members of the Haudenosaunee (Iroquois) Confederacy, span three distinct areas that intersect the U.S.-Canadian border: Ogdensburg, NY; St. Regis (Akwasasne), NY and Ontario; and Kahnawake, Ontario. Ogdensburg falls completely within U.S. territory, the international line splits St. Regis, and Kahnawake falls completely within Canadian territory.[92] The Canadians placed POEs within tribal lands of Akwasasne, which challenged the tribal sovereignty. Documentary constraints also have limited the cultural and trade transit between the tribal areas.[93]

From a Native American perspective, the "threat" to "security," that is, the threat to "freedom, security, and way of life," is border control by Mexican, Canadian, and U.S. border control agencies. From a tribal perspective, the current strategy for border security is threatening native culture, health, and safety.

---

[89] Tonra, "The Threat of Border Security on Indigenous Free Passage Rights in North America," 249.

[90] Ibid., 250.

[91] Ibid., 251.

[92] Ibid., 244.

[93] Ibid., 223–224, 226.

b. Things

Threat activities, and the people engaged in them, often (although not always) involve objects of some kind. The objects are the tools by which an adversary acquires profit, revenue, power, vengeance, or survival. The tools can be currency, counterfeit materials, information, weapons, people, or drugs. How these objects are used is yet another layer of complexity not clearly traceable to border security, but is in any case, often the argument with which border policies are justified. That is to say, the effects associated with the use of objects are the rationale for border security policies. For instance, health and crime effects of drug use, border violence, economic loss, terrorism financing, and safety concerns of counterfeit goods are all touted as the rationale for stronger border protection. The number of objects interdicted is used to measure the success or failure of protection. The hectares of coca plants eradicated in Colombia, or the number of illegal immigrants apprehended, or the number of assault weapons interdicted enroute to Mexico, for example, are used to measure the success of preventing trafficking. One "thing," intellectual property violations (IPV) are explored next.

Another object often quantified as a measure of prevention is IPV, which are counterfeit and/or compromised objects. Clothing, apparel, shoes, and other consumables are the largest percentage of IPV goods, but a growing level of attention is being placed on electronics and electronic parts. Although small in number, the effects could be catastrophic on many levels. Again, the possible effects of these objects are at the forefront of the argument, not the activity of counterfeiting or compromise, or the people engaged in the activity threat. Moreover, the volume of IPV seizures are irrelevant given the possible effects; a small quantity could create the effects most concerning to policy makers. This description will provide more evidence as to why a need exists to understand the root of behavioral dynamics behind actor intentions, instead of objects, tactics, or hierarchies.

Introduction of electronic IPV components (counterfeit or compromised) into financial, database, defense or communications systems could create vulnerabilities subject to exploitation or system failure. Counterfeit and pirated media (e.g., movies, operating systems, applications) also result in economic vulnerabilities, such as loss of

profit by companies, and revenue. A 2007 report from *The Institute for Policy Innovation*, for instance, estimated that the U.S. economy experienced a loss of 373,375 jobs, $16.3 billion in wages, and $2.6 billion in tax revenue, due to piracy in 2005 alone.[94]

The potential consequences of IPV components also pose a risk to privacy rights (e.g., medical records, identity), public safety,[95] state secrets (e.g., operational plans, logistical information), and defense infrastructure[96] (e.g., navigational systems, launch mechanisms).

The concern of espionage, safety, and economic impact via IPV has led to the creation of the *National Intellectual Property Rights (IPR) Coordination Center*, a multi-national defense taskforce with 21 participating domestic and international organizations.[97] This taskforce conducted an operation in fiscal year (FY) 2012, *Operation Chain Reaction*, which focused on goods bound for the Department of Defense or other U.S. agency supply chains. The operation resulted in the seizure of goods, electronics, currency, and vehicles valued at over $9.83 million.[98]

Electronics are as widespread and interdependent as technology itself. Economic and defense sub-systems are highly dependent, and have numerous interconnected systems that also require electronic parts. In this respect, electronic IPV components are of extreme concern. Very little research, however, explores different classifications of IPV types with the motivations and ideology of the actors producing or distributing them. Also rare is root cause analysis to understand why counterfeits continue to grow, even though interdictions are steadily increasing. The effects of the

[94] Stephen E. Siewek, "The True Cost of Copyright Industry Piracy to the U.S. Economy," *The Institute for Policy Innovation*, Policy Report 189 (2007): 1, http://www.ipi.org/docLib/20120515_CopyrightPiracy.pdf.

[95] Courtney Robinson, "Counterfeit Electronics-A Dangerous Growing Problem," *www.abc-7.com*, May 22, 2013, http://www.abc-7.com/story/22401977/counterfeit-electronics-a-dangerous-growing-problem.

[96] Eric Savitz, "The Serious Risks from Counterfeit Electronic Parts," *Forbes*, July 11, 2012, http://www.forbes.com/sites/ciocentral/2012/07/11/the-serious-risks-from-counterfeit-electronic-parts/2/.

[97] Intellectual Property Rights Coordination Center, "Home," (n.d.), http://www.iprcenter.gov/.

[98] U.S. Department of Homeland Security, *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*, CBP Publication # 0172–0113 (Washington, DC: U.S. Department of Homeland Security, 2013), 9, http://www.cbp.gov/linkhandler/cgov/trade/priority_trade/ipr/seizure/fy2012_final_stats.ctt/fy2012_final_stats.pdf.

objects themselves are highlighted as the concern; that is, the justification for enforcement. Given the components have to enter the supply chain to enter the legitimate market, reports again call for border interdiction, as well as source procurement limits.[99] Avoidance of understanding the dynamics behind why this tool is being used, by whom, in what manner, and by what ideology, will result in significant resource outlays and arbitrary enforcement.

Source procurement, gaps in production controls, gaps in identification of malicious insiders, and weaknesses in detection capabilities are some exploitable vulnerabilities within supply chains.[100] Of note, the supply chain is nearly completely owed by private companies. Once this chain is breached, however, the costs and burden of identifying and interdicting the tangible[101] forms of these goods is currently seen as a border enforcement objective. As such, execution of this enforcement objective intersects directly with the facilitation paradigm. As mentioned in a previous chapter, border enforcement results in significant economic costs.

Due to the interconnected nature of supply chains, trade has increasingly become automated to speed port throughput. If shippers are "trusted," very little hands on inspection occurs; a concern given supply chains can be exploited in ways not often detected (e.g., insider threat). This policy dynamic limits physical examinations to random computer generated compliance checks, and more infrequently, targeted selection. Even with these severe constraints on physical examination at the border, illicit IPV are being interdicted, albeit primarily from mail and express mail centers (not POEs).[102] For example, the CBP, the U.S. agency responsible for border security,

---

[99] Matthew R. Shindell, Todd Kramer, and Stanely H. Salot Jr., "The 'Ticking Time Bomb' of Counterfeit Electronic Parts," *Industry Week*, July 22, 2013, http://www.industryweek.com/procure ment/ticking-time-bomb-counterfeit-electronic-parts.

[100] Wenke Lee and Bo Rotoloni, "Emerging Cyber Threats Report 2013," *Georgia Institute of Technology*, Georgia Tech Cyber Security Summit 2012, Presented by the Georgia Tech Information Security Center and the Georgia Tech Research Institute, 4.

[101] It is important to understand that virtual and tangible forms of counterfeit and/or compromised software exist; virtual threat form is transmitted across national boundaries via a complex network of fiber optic and satellite communications platforms. Importation of virtual threats is not directly managed through the supply chain or trade laws enforced within border systems.

[102] U.S. Department of Homeland Security, *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*.

reported that of the 27,067 IPV border seizures in FY2012, 15% were consumer electronics, a 4% increase from FY2011.[103]

As a side note, it is interesting to observe that IPV are not publicly associated with the growing cyber threat paradigm. Whereas electronic IPV actors are informally understood as guided by a profit-motive, cyber threat actors are seen as having many different motivations, including terrorism and espionage.[104] Electronic IPV, either through counterfeit or compromise, are seen as separate and distinct objects from those of objects used in cyber, terrorism, or hostile-state activities. This disconnect is troubling, given software objects (viruses, malware, Trojans) are distributed via counterfeit and/or legitimate hardware components, via supply chains.

The border is used as a preventive measure to interdict these IPV objects; thus aligning with the protectionist view. Yet, as electronics seizures are increasing at the border, it becomes evident that private company supply chains are being more fully exploited, even with a plethora of facilitatory "supply chain security" initiatives.[105] What are the behavioral dynamics around the exploitation process? Is IPV a tool that, like drugs and currency, can serve as a vehicle by which many shifting motivations can capitalize? If so, the motivations of the actors would be an extremely important dynamic to understand. Given limited resources to hand inspect all shipments, and the growing agendas for speedy cross-border movement, understanding the intentions of actors that use IPV as a tool will be critical to selective enforcement.

---

[103] U.S. Department of Homeland Security, *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*, 18–19.

[104] U.S. Government Accountability Office, *Information Security: Cyber Threats Facilitate Ability to Commit Economic Espionage, Statement of Gregory C. Wilshusen, Testimony Before the Subcommittee on Counterterrorism and Intelligence, Committee on Homeland Security, U.S. House of Representatives*, (June 28, 2012). http://www.gao.gov/assets/600/592008.pdf.

[105] Scott Hudson, "Overview of U.S. Government Security Initiatives," *Poole College of Management Supply Chain Resource Cooperative*, January 31, 2006, http://scm.ncsu.edu/scm-articles/article/overview-of-us-government-security-initiatives.

C.   SUMMARY AND TAKEAWAYS

To recap briefly, threat management programs draw insight to what are perceived as threats: people, activities, and things that may cause unmanageable national effects. Due to the assumption that the effects of these threats would be irreparable, a protectionist, zero-sum control strategy guides policy. The measurement of the number of people and things intercepted is what guides assessment of prevention effectiveness.

It is important to call attention to the contradictory and inconsistent manner with which these are both understood and managed. The implementation and monitoring of prevention efforts evolves around the objects used by the threats. By this logic, the more tools interdicted, the lower the number of threats, the more secure the border. Prevention equals blocking movement of a tool used by a threat. Yet, even this concept continues to be debated. CBP seizures have increased significantly from fiscal year 2006 to 2012, yet Congress refutes any claim to a securing of the border. Policy makers shift site to people as the measure of security, not their tools or tactics.[106]

The next chapter presents the border security system as a conceptual model to demonstrate the system as a CAS. Threats, feedback loops, stocks, flows, and delays are illustrated to reflect interdependencies, rate controls, and behavioral influences.

---

[106] Brad Plumer, "Border Security Is the Key to Immigration Reform. So How Do We Measure It?," *Washington Post WONKBLOG*, June 21, 2013, http://www.washingtonpost.com/blogs/wonkblog/wp/2013/06/21/border-security-is-the-key-to-immigration-reform-so-how-do-we-define-it/.

THIS PAGE INTENTIONALLY LEFT BLANK

V.   MODELING COMPLEXITY

> And there is unity where there is community of pleasures and pains—
> where all the citizens are glad or grieved on the same occasions of joy and
> sorrow? …Yes; and where there is no common but only private feeling a
> State is disorganized—when you have one-half of the world triumphing
> and the other plunged in grief at the same events happening to the city or
> the citizens?[107]

–Plato

Since the ratification of the U.S. Constitution, managing U.S. borders has taken the form of sovereign defense, a force projection capacity, and trade as an income generator; an approach that has all but ignored cultural and social interdependencies and consequences. From 1783 to the early 20th century, borders were not seen as something to secure, as much as something to manage for revenue collection and luring immigrants to help settle the continent. Starting in 1924, the institutional vision to securing U.S. borders emerged to revolve around limiting immigration: preventing the entry of Chinese, anarchists, communists, and bootleggers, as well as political and racially driven agendas guised as threats to the "American way of life." The War on Drugs, free trade agreements, War on Terror, and economic uncertainty have led to the metastasis of this security vision into a hydra of protective defense from not only people, but all things and ideas outside of economic and political controls. This nebulous hydra creates an existential, almost cosmic[108] view of border security, void of coherent drivers behind the behavioral actions taken by law enforcement, immigrants, criminals, and terrorists. This existentialism equally applies to that which "defense" is intended to protect, a "way of life." It is no surprise, then, that in the aftermath of 9/11, this vision, protection from threats to the hegemony of the United States, exponentially broadened to include intelligence collection and paramilitary operations. Throughout the 21st century post-

---

[107] Plato, *Republic*, trans. Benjamin Jowett (1871) (New York: Barnes and Noble Classics, 2004), 166, Book 5, section 462.

[108] See Reza Aslan, *Beyond Fundamentalism* (New York: Random House Trade Paperback, 2010) for a detailed discussion regarding the concept of "cosmic war."

industrial world, securing borders has now become synonymous with "national security," "homeland security," and "global security," that is, survival.

In exploring whether U.S. border security is a complex adaptive system (CAS, this cosmic view of survival must be considered when contemplating what influences behavioral adaptations within the border system. An attempt is made in this chapter to demonstrate that the border hydra is reinforced through perceived threats rooted in the influence of foreign, social, and economic policies and beliefs, non-linear and non-enforceable. The effects of these influences upon people create the dynamics that frame the border as a CAS, and catalyze adaptive behaviors.

This chapter introduces the reader to just two common border issues, (1) transnational terrorists, and (2) trade. These two issues were chosen based upon their many intersections with the existential ideologies of the American way of life, regional, national and global economic dependencies, the intersection of defense and protection, and the frequently cited importance of these issues in homeland security budget justifications. The movement of trade and transnational terrorists will demonstrate well enough the complexity of border security, although many more issues affect the border system. Modeling of all border issues and dynamics would be untenable within the time and space of this research. The global web of trade and terrorism are sufficient to meet the objective of this thesis, to demonstrate that border security is a CAS.

Stock and flow diagrams are used to present the basic elements, activity flows, rate controls, and a sampling of feedback loops influencing movement around and through borders. Next, these smaller models are correlated with an extended-set of second and third tier influences that connect to four larger system elements: 1) institutional capabilities and priorities, 2) TCO capabilities, and 3) operational capabilities and priorities, and 4) the ability to move people and goods rapidly. The chapter ends by presenting the holistic conceptual model associated with these four elements, and a sampling of influences that interconnect them. This conceptual model provides a visual representation of the interconnected influences that holistically contribute to the behavior of the border CAS. The objective of this model is to

demonstrate that the border is indeed a CAS and provide illustration why single-issue policies, such as deploying technologies along the border, will not lead to secure borders.

A.   COMPLICATED VERSUS COMPLEX

First, it is important to differentiate between "complicated" and "complex," as each has discrete dynamics and policy implications. Distinct differences occur between "complicated" and "complex" that create decision-making implications at both policy and operational levels. Characteristics of complicated issues have discoverable and knowable causal links from which future behaviors can be predicted (assumption of order), decision making based upon maximizing pleasure and minimizing pain (rational choice), and actions that are the result of deliberate behavior (assumption of intentional capability).[109] Complicated issues are predictable, mechanistic (think procedures), and controllable,[110] and reflect the current approach to managing and securing the border. Immigration laws, and the procedures in place to enforce those laws, are an example of complicated issues.

Alternatively, causal links associated with complex issues can only be known and understood in retrospect and do not repeat (randomness), decision making is based upon sense-making (not pre-determined choices), and actions are the result of adaptation to environmental factors. Complex issues are unpredictable, create patterns at a system-level (not agent-level), and oscillate as actions expand and contract the boundaries of a system. Complex issues cannot be managed through preventive measures, as the causation and actors cannot be determined until an event occurs. The drivers behind why an individual decides to engage in illegal immigration, the methods utilized to migrate illegally, and the effects of enforcement operations upon local economies and social identities are examples of complex issues. Figure 1 illustrates the four domains of the Cynefin framework defined by Kurtz and Snowden, describing these differences:

---

[109] Kurtz and Snowden, "The New Dynamics of Strategy: Sense-making in a Complex and Complicated World," 462–463.

[110] Ibid., 468.
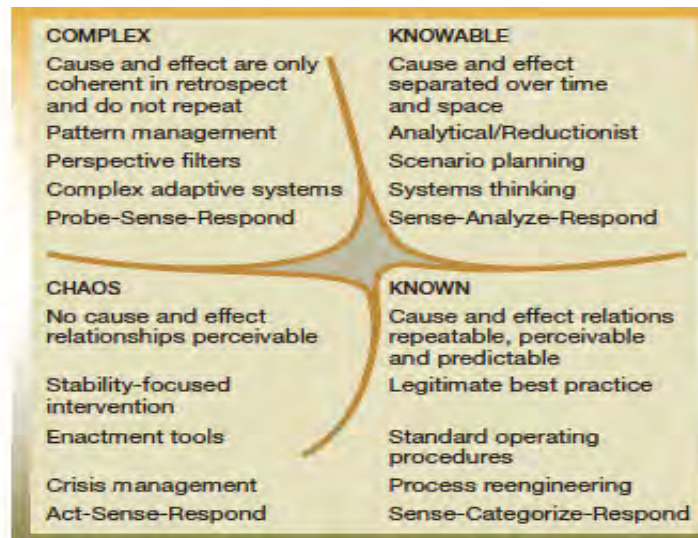
Figure 1.   Kurtz and Snowden's Cynefin Framework[111]

The "knowable" and "known" domains correlate with complicated issues, such as workflows, transportation networks, and visa application processes. The important takeaway from this differentiation is to recognize that border threats (and responses to those threats) can oscillate between these domains. These oscillations create the dynamics of a CAS. For example, by building nearly 700 miles of fencing along the southwest border of the United States, with the objective of stemming illegal migration and drug trafficking, apprehensions in select land-based regions (e.g., Tucson and Yuma Arizona) has significantly been reduced. On one hand, the "known" issue of surface traffic through specific regions was stemmed; however, the fencing has funneled access points through the border to remote areas controlled by TCOs. This funneling has bolstered the power of TCOs through control of highly coveted access routes, has led to increased cartel competition, spill-over violence, increased violence and exploitation against migrants, and disruptive innovations, such as the use of semi-submersibles, tunnels, catapults, and low-flying aircraft, which further diversifies drug and illegal immigrant entry mechanisms. The border issue of transnational terrorists entering into the United States further illustrates this idea and is explored next.

---

[111] Kurtz and Snowden, "The New Dynamics of Strategy: Sense-making in a Complex and Complicated World," 468.

B. TRANSNATIONAL TERRORISTS

Transnational terrorists crossing the border have been at the center of border security policies and operational initiatives since 9/11.[112] An individual intent on committing or supporting a terrorist act would use the same pathways of entry as an individual driven by personal objectives, such as family or employment, and criminal organizations to transit illicit contraband. Consequently, debates have blurred over the entry of terrorists, illegal immigrant entry, and TCO activities.[113] This section first provides a brief description of means of entry, and then focuses specifically on the flow model of foreign terrorists.

1. Legal Entry

Entering U.S. sovereign territory can be achieved via both licit and illicit methods. A traveler can be a U.S. citizen, U.S. permanent resident, or hold a legitimate visa (student, business, tourism, asylum, refugee), to enable entry through licit means at POEs. Travelers will not be apprehended at the border, as they would be legitimate crossers at the time of entry. The exception to this rule is when the frontline law enforcement officer receives actionable intelligence[114] at the time of processing, or intent to commit a crime is elicited from the traveler at the time of entry. Aside from this exception, the individual will enter the United States legally.

---

[112] Hernan Rozemberg, "9/11 Linked Immigration with Border Security, Anti-Terrorism," *Fronteras*, September 11, 2011, http://www.fronterasdesk.org/content/911-linked-immigration-border-security-anti-terrorism.

[113] In discussing drug trafficking, illegal immigrants, and terrorism, Andres Becker et al. quoted Alonzo Peña, former Deputy Director of U.S. Immigration and Customs Enforcement, as having said that "After 9/11, the immigrant, terrorist and criminal and the threat to national security have all been lumped together,"… "We're not distinguishing very well who is who." See the following article for more detail: Andres Becker, G. W. Schulz, and Tia Ghose, "Four of Five Border Patrol Drug Busts Involve U.S. Citizens," *The Center for Investigative Reporting*, March 26, 2013, http://cironline.org/reports/four-five-border-patrol-drug-busts-involve-us-citizens-records-show-4312.

[114] In this context, "actionable intelligence" refers to information relating to the documentable link to the crime of terrorism of the individual traveler that would provide enough evidence for refusal of entry, or evidence that could withstand judicial review. Denial of legal entry must be supported by evidence and reference a specific section of immigration law for a law enforcement officer to refuse legal entry. If a document, travel plans, criminal history, and stated intentions do not violate immigration or criminal law, admission into the United States will be approved.

2. Illegal Entry

Illicit entry can be made in four ways: imposter, fraud, stow-away, and between POEs. The first three are executed through POEs, and are the domain of the CBP, Office of Field Operations. The fourth is the only domain of the CBP Office of Border Patrol (the headquarters of the U.S. Border Patrol).

An imposter applies for entry to the United States through a POE while assuming someone else's identity.[115] Fraudulent means of entry include a person who attempts entry through a POE with counterfeit documents,[116] legitimate documents that have been altered, or legitimate documents obtained from U.S. Consulates (Department of State) through deceit.[117] A stow-away crosses through a POE while hiding within legitimate cargo, in structural voids of transportation vehicles, or in manufactured compartments. The last category, people who attempt entry between POEs, such as via tunnels, kayaks, foot, or gliders, dominates the border security debate. Apprehension rates of people within this fourth category is most often used to measure security performance and influence appropriation decisions by policy makers, although research suggests a shifting concern towards the use of fraudulent entry through POEs, in the form of refugees.[118] If border security were about illegal immigration, all four forms of illicit entry would be equally addressed. This concept is but an example of the limited understanding of border security in the public domain.

---

[115] U.S. Immigration and Customs Enforcement, "HIS Arrests 20 Cuban Imposters Seeking Immigration Benefits," News Release, April 17, 2013, https://www.ice.gov/news/releases/1304/130417miami.htm.

[116] Examples include visas, passports, birth certificates, trusted traveler and border crossing cards.

[117] An example of deceit includes someone attempting entry with a legitimate and validated student visa, with the traveler's true identity, which would be fraudulent if the traveler did not in fact intend to attend school, but registered only as a means to acquire the visa and make entry. The researcher incorporates those who overstay a visa within this category.

[118] House Committee on Homeland Security, "Subcommittee Hearing: Terrorist Exploitation of Refugee Programs," Subcommittee on Counterterrorism and Intelligence," Washington, DC, December 4, 2012, 10:00 a.m., http://homeland.house.gov/hearing/subcommittee-hearing-terrorist-exploitation-refugee-programs; C-SPAN, "House Cmte. Examines Terrorist Abuse of Refugee Programs," Washington, DC, December 4, 2012, http://www.c-span.org/Events/House-Cmte-Examines-Terrorist-Abuse-of-Refugee-Programs/10737436276–1/.

3. Identity and Radicalization

Since 9/11, "terrorists" are often assumed to be violent Islamists, originating from a foreign source, and driven by an intent to target foreign governments and the civilian populations of their espoused "far enemy."[119] This association has propelled border security into a global security domain.

These violent Islamists often become radicalized as a result of what are perceived to be threats to variable religious, cultural, economic, and sociopolitical beliefs, identity and ideologically based factors.[120] Research indicates that globalization is contributing to these factors, at the individual and group level, and vary in depth and degree by cultural context.[121·122]

4. Globalization

Globalization is a key influence upon the identities of Muslims, among others.[123] As the current "leader of the free world," the United States guides this policy, and engages in expansion and market growth initiatives needed to bolster it. Expansion and growth require presence and influence upon foreign governments, societies, and cultures, which in turn creates financial and trade dependencies between nations. These economic initiatives and foreign policy influences have resulted in negative cultural, religious, and socioeconomic threats to identities, including resurgence in racism, which in turn, marginalizes select individuals and groups.[124] This marginalization further increases

---

[119] Marc Sageman, *Understanding Terror Networks* (Philadelphia, PA: University of Pennsylvania Press, 2004), 61–64; Sageman discusses the history and definition of Muslim terrorists, which he refers to as the "global Salafi mujahedin," the dominant terrorist threat faced by the West.

[120] Anders Strindberg and Mats Wärn, *Islamism* (Malden, MA: Polity Press, 2011), 205.

[121] Henri Tajfel. ed., *Social Identity and Intergroup Relations*, European Studies in Social Psychology (Cambridge, CB2 8RU: Cambridge University Press, 1982), 161.

[122] Fathali M. Moghaddam, *Multiculturalism and Intergroup Relations* (Washington, DC: American Psychological Association, 2008), 100.

[123] Fathali M. Moghaddam, *The New Global Insecurity: How Terrorism, Environmental Collapse, Economic Inequalities, and Resource Shortages Are Changing Our World* (Santa Barbara, CA: Praeger, 2010), Kindle edition, Loc 943–1013 of 2468.

[124] Charles O. Lerche III, "The Conflicts of Globalization," *The International Journal of Peace Studies* 3, no.1 (January 1998), http://www.gmu.edu/programs/icar/ijps/vol3_1/learch.htm.

vulnerabilities to the radicalization process.[125] It is through globalization that U.S. borders are "extended," and corporate influences blur the concept of sovereign borders. In this respect, the manner in which globalization policies are implemented poses a threat to border security by creating grievances against the United States within vulnerable populations, who are then prone to radicalization.

5. Foreign Terrorist Stock and Logistical Support

Once radicalized, a person enters the stock of "foreign terrorist." When an objective is established to commit a terrorist act, planning and movement commences to align resources; in the case of the border, this means making arrangements to obtain access to U.S. targets. A key rate control of this process is logistical support.[126] The costs of terrorist financing, havens for training, propaganda, and numerous support networks for travel, documents, and safe houses are necessary for movement along the approach flow. Logistical support, in this context, is a threat to border security in that it enables undetected mobilization of terrorists towards U.S. territory.

6. Border Stock and Apprehensions

The stock of "border" is increased when the terrorist reaches the geo-political borderline (or perimeters of embassies, military bases, or other U.S. properties) and entry is attempted, either through licit or illicit means as earlier described. As the border stock raises, the flow of entry increases, controlled only by apprehension rates of illegal entry. As earlier noted, it is in the narrow view of illicit entry between POEs that currently frame most border security policy and resource decisions, one of four illegal means. When apprehension is averted, either by using legitimate entry mechanisms or by evasion of detection, the foreign terrorist enters the United States At this stage, the foreign

---

[125] Maajid Nawaz, *Radical: My Journey out of Islamist Extremism* (Guilford, CT: Lyons Press, 2013), 42–43.

[126] Sue Mahan and Pamala L. Griset, *Terrorism in Perspective*, 2nd ed. (Los Angeles, CA: Sage Publications, 2008), 117–118; the authors discussed the value of propaganda, logistical, and auxiliary support of al Qaeda. In this chapter, "logistical" is intended to encapsulate all three.

terrorist has achieved harbor[127] on U.S. soil, and border security policies become ineffectual. Any policy decisions beyond this point fall within the parameters of the domestic domain.

7.   Terrorist In-Residence Stock and Logistical Support

A terrorist in residence is free to conduct target surveillance, engage in domestic recruitment, and employ activities to sustain motivation. Upon activation,[128] the terrorist enters the process of "staging." Staging, in this context, includes acquisition of resources to commit an act of violence, positioning of those resources, and preparation of participants for engagement. The key rate control of staging is again logistical support. Financial, spiritual, resource, housing, counter surveillance, assimilation guidance,[129] and communications capabilities enable movement along the staging flow. Just as with the process of approaching the border, logistical support for terrorists once they are within the domestic domain, is a threat. When this flow is successfully navigated, the stock of "terrorist act" has the likelihood of increasing; in other words, the probability rises that more acts of violence could occur.

8.   Terrorist Act Stock and In-Group Inspiration

The methods of violence within the "terrorist act" stock widely vary. Suicide bombers, vehicle borne improvised explosive devices (VBIED), hijacking, mass shootings, sabotage of power grid components, and chemical attacks to name a few. This stock is the realm of emergency and crisis management. The higher the casualties the act creates, the larger the media coverage of the event, and the more extreme the government response to the consequences, the more likely the act will influence the acceptance and inspiration of the ideological "in-group" abroad. The humiliation of government, a plausible effect caused by a terrorist act, bolsters motivation and enthusiasm of vulnerable people facing disenfranchisement, which increases the likelihood of further

---

[127] "Harbor" in this context refers both to logistical support networks and constitutional rights.

[128] "Activation" in this context refers to a catalyst to act, be it an order from a superior, or a personal decision to begin preparations for engagement.

[129] "Assimilation guidance" refers to blending into the community, avoiding detection domestically, and sustainment of a cover identity, such as employment, marriage, and school.

radicalization, and thus, reinforces the entire cycle.[130] In this sense, heavy-handed government response, media coverage, and the lack of civic resilience are threats to border security.

Beyond the cycle reinforcement effect, the "terrorist act" stock was included in the border security sub-model to capture another dynamic that occurs within the border security system. Domestic terror attacks, when found to be perpetrated by foreign-born persons, will unleash extended debates regarding both immigration reform and border security, irrespective of how that person made entry into the United States, or what the perpetrator's citizenship status was at the time of the attack. This factor has roots in the history of U.S. borders and immigration controls elucidated in Chapter III; foreigners being seen as threats. Figure 2 represents the sub-model of the transnational terrorist movement process described previously.
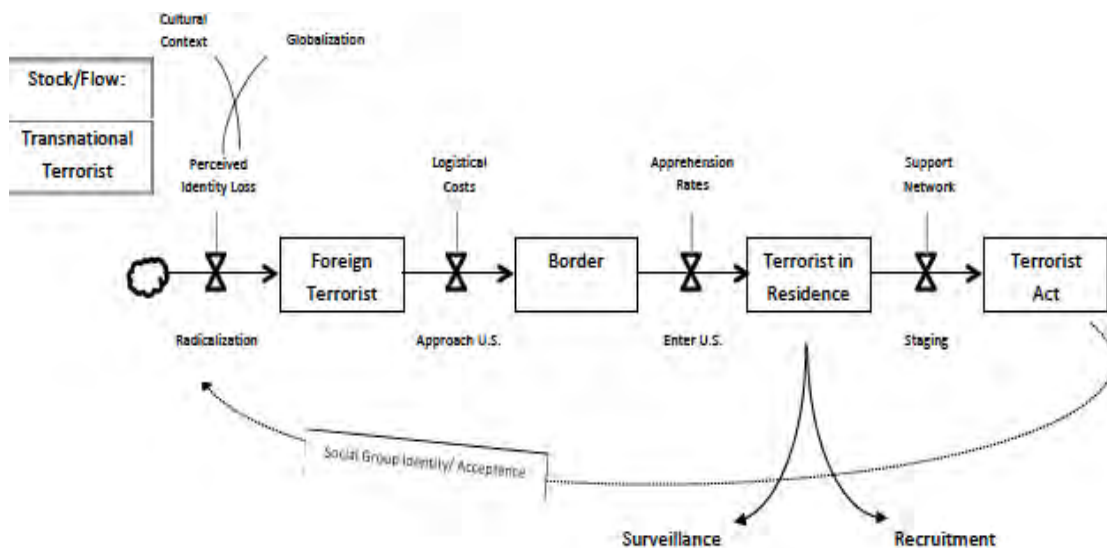
Figure 2.   Stock and Flow of Transnational Terrorist Entry into the United States[131]

---

[130] Mahan and Griset, *Terrorism in Perspective*, 29; Mahan and Griset refer to this inspirational effect as an "excitational function;" that is, a catalyst to inspire further resistance nourished through propaganda.

[131] Stock and flow diagrams provide a technique to distinguish parts of a system visually, associate their relationship to one another, identify what makes them change, and provides a foundation by which mathematical factors can be formulated to simulate behaviors. Rate control (⊠) is a factor that increases or decreases the volume of information, goods, or people moving into or out of a stock. A flow (→) represents movement of information, goods, or people. The boundary of a system is represented by a cloud (⬭).

It should be noted that this model is a finite, incomplete representation of growth and movement of terrorists to and through borders. Terrorism, the border, and connections between each stock and flow are more fluid, interactive, and adaptive than this model can display. Additionally, the boundary is set at the point when radicalization begins, which places the dynamics that lead up to radicalization out of scope. This model does not infer a complete framing of the complexities surrounding the creation of, or movement by, terrorists entering the United States.

9.   The Weakness of Apprehension Measures

Protection against the entry of the terrorist "threat" currently pivots around apprehension rates,[132] although this measure is increasingly being questioned.[133] Despite former Secretary Napolitano's claim of substantial gains in border enforcement, apprehension rates have not lead to acuity of secure borders.[134,135] Resistance to accepting apprehension rates as an indicator of border security suggests at least an informal acknowledgement that other dynamics are at play. For example, a lower apprehension rate may indicate that fewer people are attempting to enter the United States, but it may also suggest tactics are evolving beyond the need to make entry (e.g., web-based employment), new methods of illicit entry are being used, economic or social factors have changed that have lessened the ability or desire to make illicit entry, or people have already entered the country. Alternatively, a spike in apprehension rates may indicate more effective enforcement operations, but it may also suggest growth in capacity of existing networks to saturate the border domain, or it could be that economic or safety factors have changed that have shifted the willingness to accept more risk to

---

[132] Apprehension rates associate with the movement of people. Interdiction rates are also used as a pivot, but are specific to movement of "goods." This discussion is only looking at the people categorized as "terrorists," and not any "thing" that they may be carrying or transporting.

[133] Chad C. Haddal, *Border Security: The Role of the U.S. Border Patrol*, CRS Report RL32562 (Washington, DC: Library of Congress, Congressional Research Service, July 30, 2010), 11.

[134] Seth McLaughlin, "Napolitano Says Border Is Secure, Though Proof Is Lacking No Clear Measure Could Scuttle Immigration," *Washington Times*, March 3, 2013, http://www.washingtontimes.com/news/2013/mar/26/napolitano-says-border-is-secure-though-proof-is-l/?page=all.

[135] Marty Graham, "Napolitano Touts U.S. Border Security Gains Despite More Arrests," *Reuters*, February 5, 2013, http://www.reuters.com/article/2013/02/05/us-usa-napolitano-border-idUSBRE9140AF20130205.

cross (e.g., criminal violence in the border regions). A comprehensive study of apprehensions and associated dynamics is beyond the scope of this thesis; however, the concept of associated dynamics themselves contributes to the border CAS.

Border policies measured by apprehensions reflect a narrow, control-centric vision, rather than a holistic vision of identifying and understanding leverage points to counter-influence the economic, political, cultural, and social subtleties contributing to movement of future terrorists.[136] Irrespective of what apprehension rates are seen to represent, the quantitative measure fails to lend insight into the root dynamics driving the decisions people make to migrate.

Very much like those of illegal immigration enforcement strategies, current security strategies pertaining to terrorist flows focus on logistics, support, and apprehension rates as the targets for assessing security. Dismantling support networks, freezing financial assets, apprehending terrorists at the border, and conducting domestic surveillance to detect terrorists in-residence, are the current measures for managing this stock and flow process. Missing from these strategies are coherence of extended influences beyond the linear flow model, and consideration of leveraging the policies that are driving the radicalization process to begin with. One small set of extended influences affecting the rate of radicalization is proposed next.

10. Correlation: Institutional and Operational Capacities and Priorities

The behavioral influences upon a specific stock and flow extend well beyond direct rate controls. The inability of institutions (government) to provide for the basic needs of a population, such as jobs, education, legal recourse, or a forum for organized public dissent, for example, create a cadre of disaffected people ripe for radicalization.[137] Inadequate public or social services, levels of violence, and the ineffectiveness of government institutions create vulnerabilities within the civilian populations that criminal

---

[136] Becker, Schulz, and Ghose, "Four of Five Border Patrol Drug Busts Involve U.S. Citizens."

[137] Paul Shemella, ed., *Fighting Back: What Governments Can Do About Terrorism* (Stanford, CA: Stanford University Press, 2011), 182.

organizations can exploit for legitimization.[138] By way of example, a broader look at the influence of sanctions upon identities and cultural context is described next.

a.   *Cultural Context and Identity*

Cultures form through individual and group identities that then create a filter by which policies are interpreted as just or unjust.[139] National, organizational, racial, partisan, and social values, each with distinct characteristics and behavioral influences upon identity reflect some of these filters. Intractable conflicts often arise from the belief of the "rightness" of one culture over another (media, political, social, and cultural bias), heavily influenced by individual and group identities, and what are seen as threats to those identities. [140] The power of one group over another, and the sense of a loss or weakening of distinctiveness, drives much of the violent conflict, and taints the response to policies. The discernment that an individual or group is losing distinctiveness thus increases vulnerability to radicalization.

b.   *Institutional Capacity, Basic Needs, Sanctions, and Identity*

Imposing economic and trade sanctions upon another nation will severely limit the ability of a government to acquire the revenue and goods necessary to provide basic social and economic needs of their population.[141] Sanctions upon Iraq during the 1990s, for instance, are estimated to have resulted in hundreds of thousands of deaths, due to food and medical shortages, and failure of power and sanitation infrastructures

---

[138] Riley and Kiernan, eds., "The "New" Face of Transnational Crime Organizations (TCOs): A Geopolitical Perspective and Implications to U.S. National Security," 34.

[139] Simon Clarke, "Culture and Identity," *The Sage Handbook of Cultural Analysis*, 2008, August 8, 2011, 510–529, http://www.sagepub.com/healeyregc6e/study/chapter/encycarticles/ch01/CLARKE~1.PDF,

[140] Louis Kriesberg, "Identity Issues," *Beyond Intractability*, edited by Guy Burgess and Heidi Burgess, Conflict Information Consortium, University of Colorado, Boulder, July 2003, http://www.beyond intractability.org/essay/identity-issues.

[141] Mina Khanlarzadeh, "The Effects of the Economic Sanctions Against Iran," *Jadaliyya*, July 26, 2013, http://www.jadaliyya.com/pages/index/13200/the-effects-of-the-economic-sanctions-against-iran.

without supplies to make repairs.[142] Although the United States sees this tool (sanctions) as an effective measure to influence the target nation to comply with external values, the ripple effects of this policy can worsen radicalization trends. The less revenue and trade capacity a nation possesses, the less stable the social population, the higher the likelihood of violence, crime, and ideological polarization. The failure of a government to sustain a healthy economy that provides employment, education, and social mobility to its citizens, leads to national instability. Imposing economic and trade constraints can create an environment wherein basic "human psychological universals" and the need for a "minimum level of control" are denied, which can be seen to threaten collective survival,[143] and further escalates vulnerabilities towards radicalization. If the population perceives the cause of their government's failure as U.S.-imposed sanctions, grievances of the population shift away from their own government and towards the United States. It is from this effect that sanctions could be understood as a threat to border security. See Figure 3.

---

[142] John Mueller and Karl Mueller, "Sanctions of Mass Destruction," *Foreign Affairs*, May 1, 1999, http://www.foreignaffairs.com/articles/55009/john-mueller-and-karl-mueller/sanctions-of-mass-destruction; Estimates include an increase in infant mortality from 3.7 to 12%; 40,000 more deaths per year of children, and 50,000 more deaths per year of older Iraqis as a result of severe economic and trade sanctions.

[143] Fathali M. Moghaddam, *How Globalization Spurs Terrorism: The Lopsided Benefits of "One World" and Why That Fuels Violence* (Westport, CT: Praeger Security International, 2008), Kindle edition, Loc 1414–1442 of 2468.
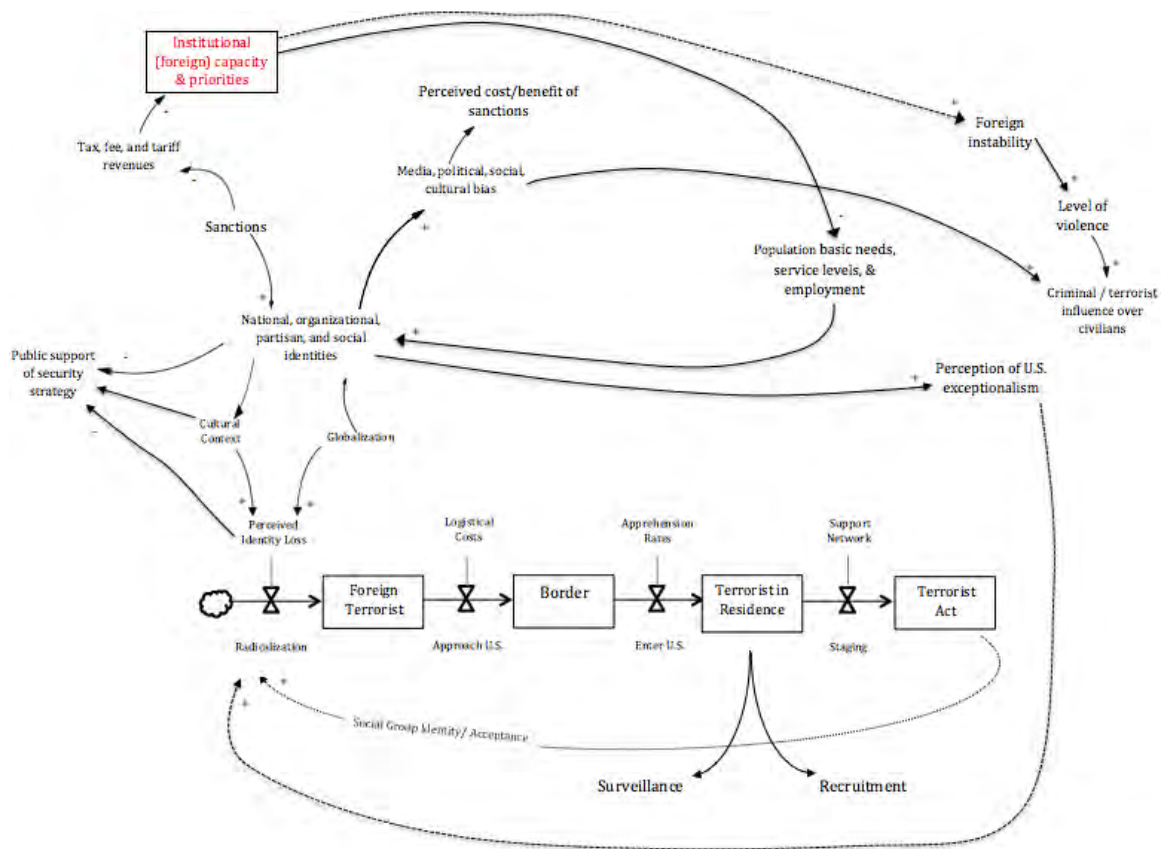
Figure 3.　Systemic Influences Effecting Rate of Radicalization Through Threat to Identity[144]

c.　Operational Capacity and Priorities, and Public Support

An operator's[145] coherence of social and cultural dynamics influences the choice of policy to fit a particular region, and whether the populations within that region support the policy (or authority), or reject it as illegitimate.[146] The level of resources expended towards an operational policy, and how balanced that policy appears to be (hard versus soft) as seen from a cultural context, also contributes to whether the public

---

[144] The information flows display either positive (+) or negative (-) relationships. A positive (+) indicates an increase in the level of influence. For example, an increase in the value of culture will lead to an increase in the levels of perceived identity loss. The opposite holds true for negative (-) influences. For example, a decrease in the capabilities of institutions leads to a reduction in meeting the basic needs of their populations.

[145] The term ' operator' refers to diplomats, elected officials, law enforcement, and the military.

[146] Robert Beljan, "Afghanistan: Lessons Learned from an ISAF Perspective," *Small Wars Journal*, May 30, 2013, http://smallwarsjournal.com/jrnl/art/afghanistan-lessons-learned-from-an-isaf-perspective.

tolerates the effort.[147] A lack of social and cultural awareness contributes to ill-fitting policy choices, and are in turn likely to be seen as a threat to the affected population. The perception of a policy as imbalanced and unfair, combined with the inability of a government to provide basic needs as a result (such as with a sanction), will further polarize and challenge national and other social identities. It is in this context that ill-fitting, imbalanced operational policies, which do not reflect social and cultural awareness, are threats to border security, as they can contribute to increased rates of radicalization, and by extension, the stock of foreign terrorists intent on entering U.S. territory.

Issues, such as economic policies, culture, identity, and institutional capacity, interface to create the threat of a person entering the United States to commit a violent act. Probing and adjusting the policies serving to drive the growth in radicalization are the leverage points. When it comes to border security programs, however, resources continue to be disproportionately concentrated at the geo-political border, as a form of deterrence and projection of an "image of authority and power."[148] This strategy, when seen from the global perspective as just described, reinforces radicalization. See Figure 4.

---

[147] U.S. Department of State, "Chapter 2. Country Reports: South and Central Asia Overview," Country Reports on Terrorism 2012, Office of the Coordinator for Counterterrorism, May 30, 2013, http://www.state.gov/j/ct/rls/crt/2012/209983.htm; Report notes under "Kazakhstan" that "critics claimed that official measures to counter radicalization and violent extremism were often too heavy-handed and could result in increasing radicalization.

[148] Peter Andreas, "Redrawing the line: Borders and Security in the Twenty-First Century," *International Security* 28, no. 2 (Fall 2003): 109–110, http://www.brown.edu/Departments/Political _Science/documents/Redrawing_the_Line.pdf.
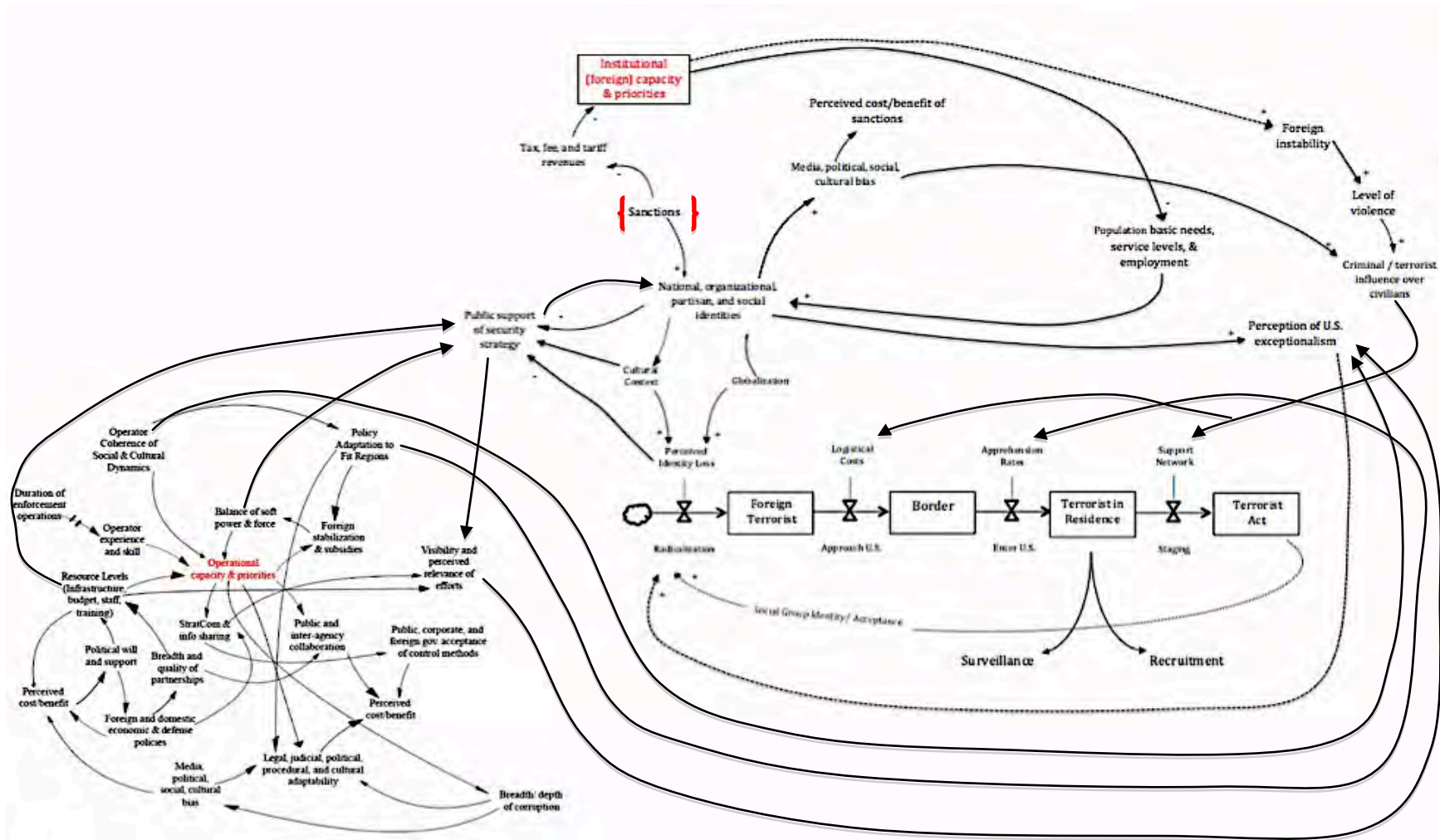
Figure 4.   Correlation between Operational and Institutional capacity and identity

The failure to comprehend holistic systemic behavioral indicators that lend insight to alternative, and more cost-effective strategies, constrain the vision of border security to a mechanism for surveillance and detection technology, growth of staffing for reactive capacity, and control approaches between POEs. Insofar as terrorist entry, the vulnerability to border security is radicalization and identity dynamics catalyzed by U.S. policies, not what is often phrased as "porous borders." Next, globalized trade, another process that contributes to increased rates of radicalization and criminal activities, yet is most often framed as border management instead of security, is explored.

C.   TRADE

As detailed in Chapter III, trade of services and goods across borders has, and continues to be, the basis of economic, national, and global power. The expansion of trade, consumption, and resource acquisition to further grow foreign power and influence, are the drivers of globalization, and contribute to protracted "resource wars."[150] Not surprisingly, trade facilitation across borders is critical to the sustainment of globalization and power politics. The interdependencies throughout cross-border trade contribute to border CAS dynamics. By way of a simplified introduction, the flow of foreign production, foreign export, domestic import, and finally, movement through the domestic market to corporate profit, will describe one facet of these interdependencies.

1.   Resources and Production

The border serves as a corridor through which U.S. and foreign manufactured goods and finance are exchanged. Resource acquisition (land, labor, knowledge, capital, enterprise) is the key rate control of production,[151] growth and reduction of which create oscillations throughout trade, environmental, social, and cultural systems. Insofar as trade, the lower the reserve of raw materials, skills, and land, the slower the rate of production. It stands to reason that increased access to these resources result in increased production.

---

[150] Philippe Le Billon, "The Geopolitical Economy of 'Resource Wars,'" *Geopolitics* 9, no. 1 (March 2004): 1–28. http://www.neiu.edu/~dgrammen/2004LEBILLON.pdf.

[151] Business Dictionary.com, "Factors of Production," (n.d), http://www.businessdictionary.com/definition/factors-of-production.html.

2.   Foreign Supply Chain Stock and Trade Agreements

Increased flows of production create a larger stock of "foreign supply chain." Supply chain in this context refers to the corporate and public infrastructure needed to develop, build, market, transport, and sell a commodity. These chains are ecosystems of transportation systems, labor markets, shipper and distribution networks, real estate and manufacturing bases, as well as regulations, tax, tariff, patent, and wage laws. Trade agreements between nations facilitate the transference of commodities that exude through these chains, via import and export flows.[152] The more mutually conciliatory the agreements are (lower tariff rates, standardized rules, reduction of regulatory constraints) the faster (less physical inspection) and more robust (volume and special interest) the flow to and through the border.[153]

3.   Border Stock and Compliance Rates

To move rapidly through the border, shippers must comply with specific transport, marking, safety, and fee structures.[154] The more compliant the shipper, the more quickly commodities transit through the border corridor and enter into and out of the domestic supply chain. Compliance rates can be misleading, however, in that the framework to inform compliance is significantly constrained by volume of import and export flows. Trade volume has expanded to such a degree that physical, human inspection of every shipment is untenable.[155,156] The mechanics of determining

---

[152] Executive Office of the President of the United States, "Outlines of the Trans-Pacific Partnership (TPP)," Office of the United States Trade Representative, November 2011, http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/outlines-trans-pacific-partnership-agreement.

[153] Nakatomi Michitaka, "Improving Global Supply Chains by an Issues-Based Plurilateral Approach," Concept Paper for an International Supply Chain Agreement (ISCA), Research Institute of Economy, Trade and Industry, October 29, 2012, http://www.ide.go.jp/Japanese/Event/Sympo/pdf/2013wto_nakatomi01.pdf.

[154] Vivian C. Jones and Marc R. Rosenblum, *U.S. Customs and Border Protection: Trade Facilitation, Enforcement, and Security*, *Congressional Research Service*, CRS Report R43014 (Washington, DC: Library of Congress, Congressional Research Service, March 22, 2013), http://www.fas.org/sgp/crs/homesec/R43014.pdf.

[155] Food & Water Watch, "Import Alert: Government Fails Consumers, Falls Short on Seafood Inspections," July 2007, http://www.safeharborfoods.com/fish-mercury-resources/Food-WaterWatch-ImportAlert7–07.pdf.

[156] Stephen E. Flynn, "Port Security Is Still a House of Cards," Center for National Policy, *Far Eastern Economic Review*, January/February 2006, http://cnponline.org/ht/display/ContentDetails/i/16643/pid/.

compliance with regulatory structures is a complicated framework, but the effect of volume, multilateral agreements, and political influence upon when, where, and how to employ those mechanics create complexity.

The dynamics placed upon verifying compliance, while concurrently being held to a standard of rapid transit, continues to baffle border management. Mechanistic solutions are continually applied in an effort to address what are in reality complex systems that cannot be addressed through procedural improvements. To establish compliance, automated manifests and technological exams are rapidly reviewed, in lieu of physical examination; the focus continues to be a timestamp, guised as secure if the commodity moves through a machine. Automated manifests, radiation port monitors, sensors, x-rays, and sniffers, for example, replace physical exams. In theory, if documented names, descriptions and codes, shapes, and densities, align with requirements and manifests, they are deemed compliant, and a shipment will make entry without further need of inspection.

4. Domestic Supply Chain Stock and Market Rates

A good that enters the United States must have a demand by which it will transit through the domestic market. The key rate control of the domestic market is reflected in this model as the "market rate," applied in this thesis to represent the quantity of supply in relation to consumer demand for the commodity. Many dynamics occur within the subject of economics and marketing that affect supply and demand, which are beyond the scope of this thesis. The key point is to recognize that without demand, a producer, shipper, and distributor do not have an incentive to move a good to or within a consumer market, let alone through border corridors. This process within the trade model applies equally to both licit and illicit goods.

5. Corporate Profit Stock, Taxes, and Employment Costs

The rhetoric in support of increasing trade flows is that the profit acquired by corporations will lead to reinvestment, national economic growth, and job creation.[157]

---

[157] World Trade Organization, "10 Benefits to the WTO Trade System," (n.d.), http://www.wto.org/english/ thewto_e/whatis_e/10ben_e/10b07_e.htm.

Again, many political and economic dynamics influence the reality of these claims,[158] but this model will employ the assumption that growth in cross-border trade will indeed lead to reinvestment.

The more robust the market rate, the more corporate (or criminal) profit stocks grow. As profit grows, corporations (or criminal organizations) bolster capital stock, which in turn, is moderated by tax rates (or criminal bribes/pay-outs). Profit can also be used towards job creation (or criminal network building), as production and exchange expand. The rate by which jobs are created are moderated by what is called "employment costs" in this thesis, such as education, training, minimum wage, and benefit requirements (or criminal risk of capture or competitive organizations). Figure 5 represents the sub-model of the trade process described above.
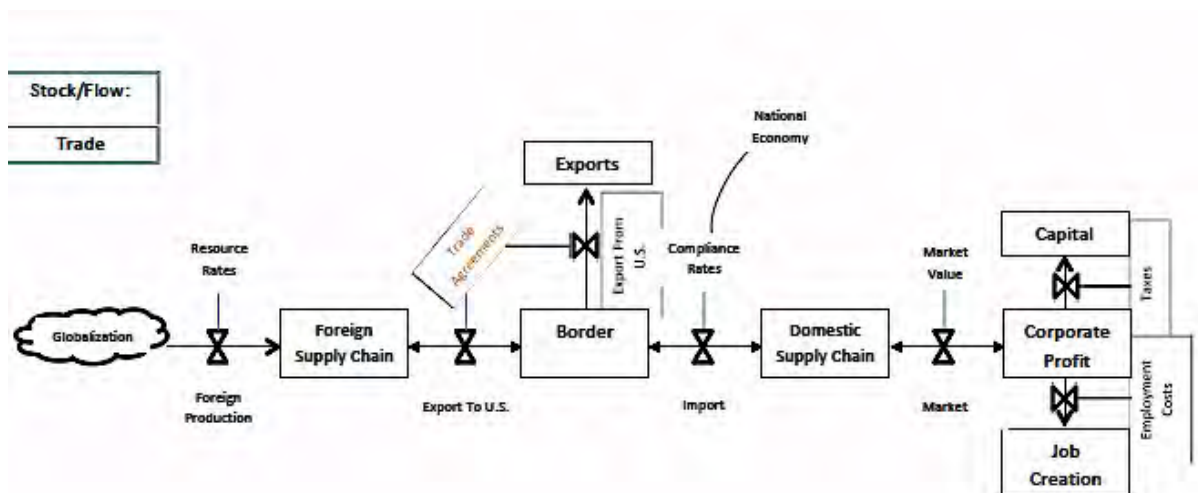
Figure 5.   Stock-and Flow Diagram of Trade into the United States

The driver behind foreign production, the start of this flow, is globalization. In other words, the continued expansion of trade, resource acquisition, military influence,

---

[158] Mark Gongloff, "So Much Corporate Cash, So Little Use: Seven and a Half Things to Know," *The Huffington Post*, March 8, 2013, http://www.huffingtonpost.com/2013/03/08/seven-and-a-half-things-you-need-to-know_n_2833227.html.

economic and political interdependency, and expansion of boundaries.[159] The theories and dynamics of globalization and economic behaviors are beyond the scope of this model, but are essential to understanding the behavior of the holistic border security system and need to be modeled before a computational model of the border CAS can be built and tested. Determining how to model these in any reliable way will be a substantial challenge.

6.   Trade Facilitation Takes Priority Over Security at the Border

As globalization drives the trade flow forward, the more critical production, supply chains, and imports and exports, become the facilitation of which is threatened by physical inspection protection measures employed to identify and interdict illegal, and categorically prohibited goods, through POEs. These measures become a threat to business, in the minds of some policy makers, and thus, catalyze policies that replace physical inspection with scanning technologies, and the merging of bi-lateral enforcement agencies,[160] which further blurs border definitions. Numerous audit reports demonstrate this trend, where in one breath it is acknowledged that CBP's priority is to stop criminals and terrorists from entering the United States, only to immediately focus on failures of facilitation at POEs.[161] It is the latter administrative measure by which POE operations are critiqued by policy makers.[162] Whereas between POE operations are evaluated by apprehensions, timekeepers assess POE operations. The former is based on a security posture, the latter, industry and multilateral economics.

The border trade model as reflected in this thesis creates three national security vulnerabilities: lower revenue production (trade agreements reduce tariff and duty

---

[159] Catarina Kinnvall, "Globalization and Religious Nationalism: Self, Identity, and the Search for Ontological Security," *Political Psychology* 25, no. 5 (2004): 743, http://identities.org.ru/readings/Religion_globalsiation_and
.pdf.

[160] John Engler and John Manley, "Strengthening Cross-Border Trade With Canada," The Hill, blog, January 21, 2013, http://thehill.com/blogs/congress-blog/economy-a-budget/278327-strengthening-cross-border-trade-with-canada.

[161] One of many examples: U.S. Government Accountability Office, *Border Security: CBP Lacks the Data Needed to Assess the FAST Program at U.S. Northern Border Ports*, (2010).

[162] U.S. Government Accountability Office, *U.S.-Mexico Border: CBP Action Needed to Improve Wait Time Data and Measure Outcomes of Trade Facilitation Efforts*, (2013), 1–2.

collection), increased dependency upon foreign resources (interdependent supply chains), and reduced inspectional capacity (law and safety), due to volume and facilitatory policies (quantity prioritized over quality). Complex issues, such as international trade policies, limited resources, market fluctuations, and employment, interface with the threat of a commodity entering the United States without inspection, revenue production, or verifiable regulatory compliance. Facilitation measures reinforce a narrow field of vision that focuses on complicated, mechanistic processes, such as facility design, automated manifesting, and traffic flows; not complex adaptive social systems. The vision of retrofitting complicated processes to enhance border throughput (i.e., facilitation) fails to recognize the wider security implications of such efforts.

7.   Correlation: Ability to Move People and Goods Rapidly and TCO Capacity and Priorities

The foreign terrorist model described previously was presented in an iterative manner by walking the reader through a series of images, each building upon the other. This approach was taken to ease the reader into comprehending the complexity of the model, and volume of influences. Now that the reader is familiar with model components, and should be more comfortable interpreting the diagrams, the trade model correlations that follow are provided at once, in a single image.

The political drivers, expanding and contracting boundaries of supply and demand, and the influence of trade, create numerous social and economic "push and pull" dynamics[163] through and around borders. The U.S. economy is structured around continued growth and expansion into foreign markets, which contributes to the growth of radicalization as earlier described. Facilitation of trade, when explored at a systems level, reinforces many of the same social and economic challenges described in the terrorist sub-model, and consequently also influences drug and crime levels.

---

[163] For a discussion of push and pull, from a public health perspective, associated with deterioration of social and environmental factors created by globalization see Corinne Packer, Ronald Labonté, and Vivien Runnels, "Globalization and the Cross-Border Flow of Health Workers," in *Globalization and Health: Pathways, Evidence and Policy*, Chapter nine, ed. R. Labonte, T. Schrecker, C. Packer, and V. Runnels (New York: Routledge, 2009), 213–234.
http://www.globalhealthequity.ca/electronic%20library/Globalization%20and%20the%20Cross-Border%20Flow%20of%20Health%20Workers.pdf.

a. *Trade Agreements and the Ability to Move People and Goods Rapidly*

Trade agreements have a direct influence onto the ability to move people and goods rapidly through borders. Agreements are negotiated under the auspices of doing just that, by incentivizing foreign investment and production, and reforming import and export processes. Border facilitation is structured around these agreements, as evidenced by the emergence of facilitatory programs, such as Free and Secure Trade (FAST),[164] and Customs-Trade Partnership Against Terrorism (C-TPAT)[165] were developed with the participation of corporations.[166] The impact of trade agreements extends well beyond the speed of goods exchange, however.

Trade agreements, such as the Trans-Pacific Partnership (TPP), Trans-Atlantic Trade and Investment Partnership (TTIP), and the North American Free Trade Agreement (NAFTA), are tools of globalization and foreign policy. Trade and regulatory tribunals are formed, and non-state, corporate and special interest-led entities empowered to review and impose economic sanction-like penalties onto government regulations or laws seen as unfavorable to corporations.[167,168] The political, social, cultural and moral

---

[164] Canada Border Services Agency, "Free and Secure Trade Program Factsheet," (n.d.), http://www.cbsa-asfc.gc.ca/media/facts-faits/027-eng.html.

[165] U.S. Customs and Border Protection, "C-TPAT: Program Overview," (n.d.), http://www.cbp.gov/linkhandler/cgov/trade/cargo_security/ctpat/ctpat_program_information/what_is_ctpat/ctpat_overview.ctt/ctpat_overview.pdf.

[166] See Office of Inspector General, "Free and Secure Trade Program-Continued Driver Eligibility," *U.S. Department of Homeland Security*, Report OIG-12–84, May 2012, http://www.oig.dhs.gov/assets/Mgmt/2012/OIG _12–84_May12.pdf for one example of how immigration (i.e., driver eligibility) and safety issues are juxtaposed against facilitation.

[167] Francesca Rheannon, "Red Light On Green: How International Trade Tribunals Threaten Sustainability and Green Business," *Corporate Social Responsibility Newswire*, June 13, 2013, http://www.csrwire.com/blog/posts/ 886-red-light-on-green-how-international-trade-tribunals-threaten-sustainability-and-green-business.

[168] Public Citizen, Eyes on Trade-Blog on Globalization and Trade, "Corporations Now Using Foreign Tribunals to Attack Domestic Court Rulings," October 16, 2013, http://citizen.typepad.com/eyesontrade/2013/ 10/investors-are-increasingly-challenging-states-constitutional-court-decisions-in-investor-state-tribu.html.

policy implications of trade agreements (and consequentially resource rates) negatively influence identities and perceptions of the fairness of policies.[169]

b. *Perceptions of Fairness, Basic Needs, and Drug Crime Levels*

When a segment of a population is stripped of basic needs and rights, policies are seen as unfair or unjust, and identities are threatened, they are more likely to migrate in search of opportunities, or join organizations (e.g., MS-13, FARC) seen as their only option to survival. If poor or marginalized, these effected populations are more vulnerable to entering into drug use and crime to meet their needs, absent legitimate employment options or capacity to migrate safely and legally. Once in the drug and crime scene, they are more likely to be recruited by TCOs.

Insofar as trade flow, these affected populations will be faced at some point, with a choice between engaging in legitimate or illicit cross-border activities. Each person is faced with a cost benefit analysis, to include acquiring the means to meet basic needs, empowerment, and level of risk acceptance (including arrest, injury, or threat of death by TCOs). The result of said analysis will directly affect a fraction of the workforce engaged in trade. A corrupted workforce then affects legitimate trade, by using transportation networks to ship prohibited goods or people through borders, which thereby, undermines the efficacy of facilitation programs.

As levels of cross-border illicit trafficking through trade corridors increase, desired security levels also increase, which leads to increased control measures. After a short delay, the cost of those control measures (political, economic, social) lead to a reduction in control measures. In this context, public, corporate, and foreign government acceptance levels of control methods influence whether a benefit to the measure occurs. This dynamic occurs regardless of threat category, be it terrorist, criminal, or illegal immigrant, as was most clearly witnessed in the first couple of weeks following 9/11, with the economic and employment fall-outs due to 100% inspections of cargo. In a less dramatic scenario, following the congressional requirement for 100% sea container

---

[169] Stan Sorscher, "Trade Agreements Reveal How Life Will Be Organized in 2050," *Huffington Post-The Blog*, October 30, 2013, http://www.huffingtonpost.com/stan-sorscher/trade-agreements-reveal-how-life_b_4090014.html.

inspection, this "perceived benefit/ acceptable cost/ desired security level" reinforcing feedback loop continues to constrain CBP from implementing the requirement fully at POEs. See Figure 6.
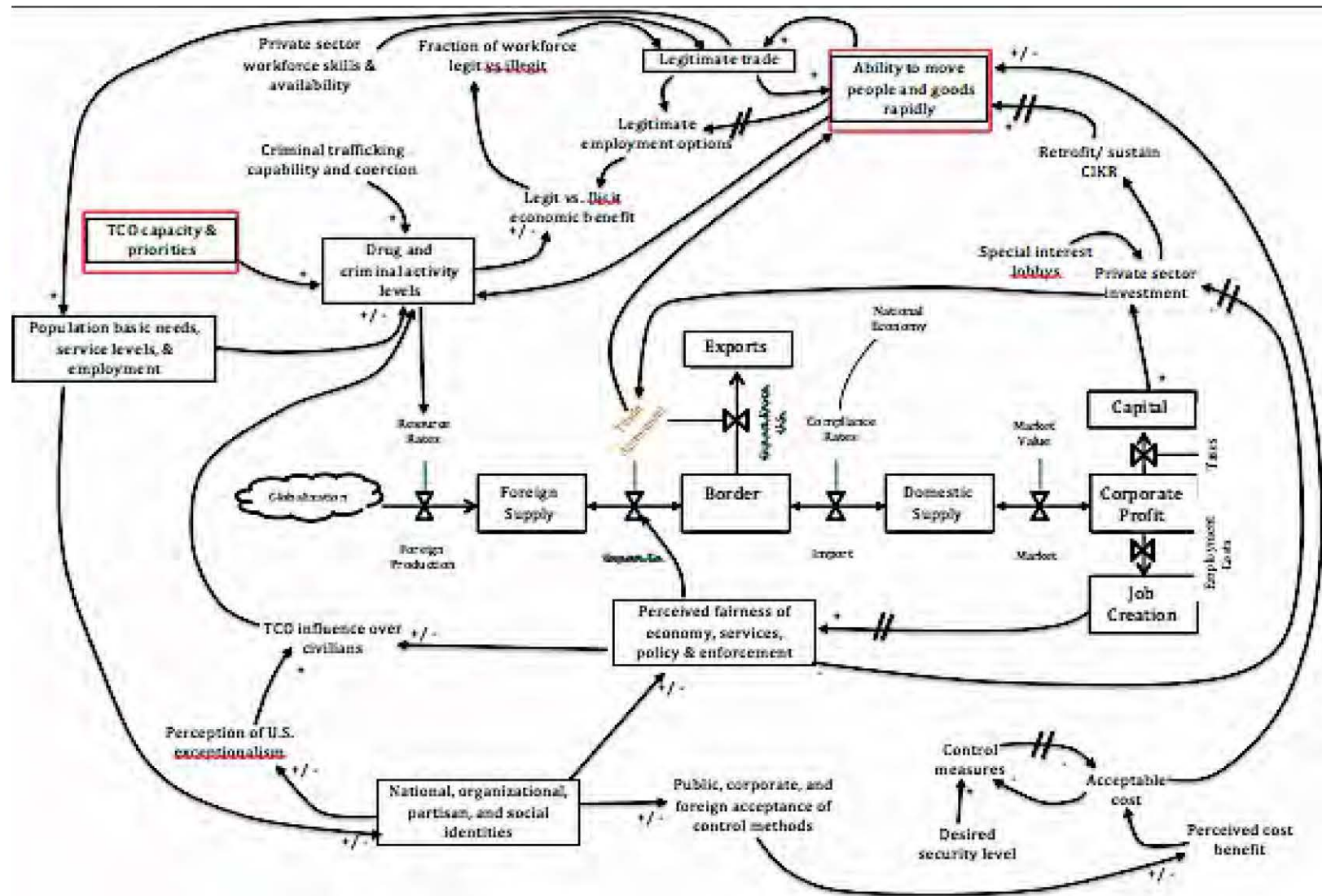
Figure 6.   Expanded Trade Flow Influences.

The influence of trade agreements and corporate power on policy decisions to employ faciliatory policies over security, are reflective of highly interdependent economic interfaces at borders. The effects upon basic population needs being met, employment options, and social identity dynamics, reflect the highly complex interconnections of foreign policy, trade, social welfare, and crime. The as-is approach of border security to balance these issues is to apply mechanistic, technology-based applications. The threat, a highly interfaced network of social, moral, political, cultural, and economic factors driving crime, will not be prevented, nor will the United States be protected, through employment of "known and unknown" protocols, like FAST.

8.   Putting the Pieces Together: The Conceptual Model

Culture, identity, adversarial adaptation, enforcement, and moral values influence, and are all influenced by perceptions of what is seen to be a threat. Through the two sub-models described in this chapter, "transnational terrorist" and "trade," four policy-centric, external pillars that affect border security become evident: 1) institutional capacity and priorities, 2) criminal capacity and priorities, 3) the ability to move people and goods across borders rapidly, and 4) operational capacity and priorities.

The border is the frontier landscape of globalization. It is at once a region, corridor, node, and frontier within which a merger of "us" and "them" is occurring: domestic and foreign, rich and poor, secular and religious, individual and collective, social and political, moral and amoral. Single-issue policies, such as the southern border fence and immigration reform, are evidence of an incoherence of this complexity.

Globalization in its current form has blurred the efficacy and coherence of geo-political borders. The borders, from an institutional perspective, have become an all but declared proxy war zone that must be defended at any cost, from value-based threats. Yet, as evidenced by trade and economic policies, this defense becomes a hindrance to facilitation. The protectionist vision has created a border security industry grounded on force, surveillance, suspicion and restriction. Simultaneously, economic and foreign interdependencies bolstering globalization require borders to be fluid, and policies associated with them faciliatory. As nations continue to expand economic and resource

interdependencies in the name of growth, the systems of social welfare, identity, employment, criminal enterprises, and corporate interests, also become interdependent and evolve.[170] As the border security complex continues to struggle with bridging "security" with "facilitation and growth," social groups throughout the world, in turn, struggle with the effects these issues place upon their safety and identity. Understanding the border as a CAS is one step towards understanding the consequences of these struggles, and towards better informing border security policy decisions.

The next page presents the larger conceptual CAS model of border security (see Figure 7). The stock and flows are not displayed, and can be thought of as layered beneath the image. Many, perhaps hundreds, of stock and flows pertain to these dynamics. In an effort to assist the reader in interpreting the model, approach it as a quad chart, although it should be understood that the pillars are not distinct from each other, or reducible components. The systems evolve due to oscillations in any one of the other systems, or combination thereof. The institutional capacity pillar, and influences surrounding that system, is located in the upper left quadrant of the model, and can also be found in Appendix B. The TCO capacity pillar is located in the upper right quadrant, and in Appendix C. The operational capacity pillar is in the lower left quadrant (Appendix D), and the ability to move people and goods rapidly in the lower right (Appendix   E).

---

[170] See Jane Kelsey and Lori Wallack's paper "Investor-State" Disputes in Trade Pacts Threaten Fundamental Principles of National Judicial Systems," *School of Law, The University of Auckland, New Zealand and Public Citizen's Global Trade Watch Division*, Washington, DC, April 2012. For a discussion on how trade agreements can be seen to threaten rule of law, constitutional powers, environmental regulations, and civil rights, http://tpplegal.files.wordpress.com/2012/05/isds-domestic-legal-process-background-brief.pdf.

Figure 7.   Conceptual Model of Border Security

9.   With Influence Comes Leverage; with Dynamics, Insight

Not recognizing the border as a CAS, devoid of predictability and control, will constrain decision-makers' ability and capacity to achieve coherent situational awareness. Single-issue policies will continue to plague public discourse, and will lead to a continuation of missed opportunities for effective leverage. Why do apprehensions rates not indicate a secure border? Do control, surveillance, fencing, and force create security? Leaders must begin to ask, "security for whom exactly, and for which moral value specifically?" By exploring how differing social, political, cultural, and moral influences affect crime rates at borders, leverage points will begin to emerge. The ecosystems of trade, radicalization, foreign policy, identities, and technology will be understood to create many highly complex adaptive systems, interconnected, and constantly evolving. Only then will decision makers begin to understand the folly in ordering costly, mechanistic, and counterproductive enforcement policies and strategies.

> As societies across the globe have become increasingly inter-linked and inter-dependent, it logically follows that crime would therefore follow-suit thus becoming transnational in ways that now concern us.
>
> Therefore, gaining the understanding that is required must therefore begin with understanding how our societies are changing and interacting with others…. Trade, monetary flow, urban sprawl irrespective of borders, legal and illegal immigration, and cyber connections, among many others, are changing at dizzying speeds and in highly complex ways. All of these trajectories, all of these changes, and the first, second, third, etc. order impacts each change and trajectory has on all the others, create a web of changing realities that constitute today's world.
>
> Within this almost incomprehensible maze of change lies the opportunities and vulnerabilities within which an increasingly interconnected array of criminal actors ply their trade. ….[F]irst, we must understand, and not just the criminal, but also the rapidly changing environment within which he operates. To act before we understand is more likely to be folly than wisdom.
>
> –Major General Michael Negata[171]

---

[171] Riley and Kiernan, eds., "The "New" Face of Transnational Crime Organizations (TCOs): A Geopolitical Perspective and Implications to U.S. National Security," 4–5.

THIS PAGE INTENTIONALLY LEFT BLANK

VI. CONCLUSION

A. INTRODUCTION

As technology and threats rapidly adapt in a changing and budget-constrained environment, the homeland security project must also adapt its missions, strategies, and performance to seek coherence of a continuously evolving complex ecosystem continually, while also balancing between growth, speed, and effectiveness. The social nature of the border system creates dynamics that inhibit predictive capabilities, and renders traditional performance measures useless. Apprehensions of illegal immigrants do not, for example, inform decision makers as to the state of the border. The reasons why those immigrants chose to cross, and under what circumstances, would be more informative. Similarly, the kilograms or pounds of drugs seized do not inform the state of the drug trade. The reasons why Americans continue to have an appetite for narcotics, what types, and why they have not received treatment (or re-engaged in drug use after treatment) would be lend significant insights into the state of cross-border trafficking.

The primary objective of this thesis was to demonstrate border security is a CAS, and if so, whether this finding would serve to better inform policy makers as to the nature and state of the border and security. Illustrating the value of thinking in systems (instead of missions or programs) was a second objective of this thesis. Lastly, this thesis intended to challenge assumptions of what borders and border security are thought to be, catalyze discussions about the interconnections of identity, globalization, push and pull influences, and to inspire creativity in thinking about 21st century borders: what they represent and the challenges they pose.

A graphic model was chosen to illustrate the border CAS visually. System dynamics was chosen as the archetype for the conceptual model to convince the reader, through visual illustration, that border security is not a linear, geographic or static process, but rather a CAS with oscillating behavioral attributes that respond and evolve (both positively and negatively) to policy implementations and information feedback loops. Relationships between actors and elements were explained at the macro-level, and

components, relationships, elements, and influences were selected for incorporation if they were found to have a geographical, functional, social, strategic, financial, technological, or have oversight nexus to the border system.

B.   SYNTHESIS OF FINDINGS

A CAS is a group of simple parts, items, and/or people that interact and collectively influence the behavior of the larger system, which is irreducible to its parts. Just as a CAS cannot be reduced to its parts, the properties of the parts cannot be combined to describe the whole. System behavior can be observed holistically, lending insight as to the interactions and behaviors between the parts of the system. Borders are more than a line separating countries. They serve as areas, regions, corridors, frontiers, and political and cultural interfaces. They are also economic hubs, influence foreign diplomacy, reflect values (and fears), and can be used to start wars. These dynamics and relationships create the complexity that is the border CAS.

Border security programs draw insight into what are perceived as threats: people, activities, and things that may cause unmanageable national effects. The assumption is that the effects of these threats would be irreparable to the "American way of life," and thus, requires a protectionist, zero-sum control strategy. Yet, borders are interdependent and evolve with globalization, social and cultural migration, and technological growth. The border system cannot be secured, nor can threats be predicted. The disconnect between threat, protectionism, and the characteristics of the border CAS illustrate an example of the gap in knowledge that this thesis is contributing to bridge. Borders are cross-matrixed with many divergent people, activities, and things, licit and illicit, and yet, the "American way of life" still stands. Given that threats are fear-based, border security programs lend insight into the fears and uncertainty of policy makers.

Border policies, such as the southern border fence and immigration reform, do not reflect coherence of system dynamics, are ill suited for the globalized 21st century, and create more vulnerabilities, such as decentralization of criminal organizations, increased dangers placed upon migrants, and catalyzing criminal organizations to innovate smuggling methods (e.g., catapults, semi-submersibles, surgically implanting dogs).

Moreover, understanding why the United States chooses to see something as a threat requiring both media and executive attention, as well as excessive resources and force, is a key factor in understanding the border CAS. Agencies, adversaries, elected officials, nongovernmental organizations, and activists alike are part of the CAS, and thus, create dynamics through their behaviors. Critically self-assessing social, political, economic, cultural, and psychological influences and motivations driving threat perception are just as important to making sense of "why it is the way it is," as studying TCO behaviors.

Globalization in its current form has blurred the efficacy and coherence of geo-political borders. The borders, from an institutional perspective, have become an all but declared proxy war zone that must be defended at any cost, from value-based threats. Yet, as evidenced by trade and economic policies, this defense becomes a hindrance to facilitation. The protectionist vision has created a border security industry grounded on force, surveillance, suspicion, and restriction. Simultaneously, economic and foreign interdependencies bolstering globalization require borders to be fluid, and policies associated with them faciliatory. As nations continue to expand economic and resource interdependencies in the name of growth, the systems of social welfare, identity, employment, criminal enterprises, and corporate interests also become interdependent and evolve.

Through modeling of "transnational terrorist" and "trade" cross-border movement, four policy-centric, external pillars that affect border security became evident: 1) institutional capacity and priorities, 2) criminal capacity and priorities, 3) the ability to move people and goods across borders rapidly, and 4) operational capacity and priorities. Culture, identity, adversarial adaptation, enforcement, and moral values influence, were found to influence and be influenced by, perceptions of what is seen to be a threat. The border was found to be a frontier landscape of globalization. It is a merger of "us" and "them," domestic and foreign, rich and poor, secular and religious, individual and collective, social and political, moral and amoral. The border and border security serve as an intersection of interdependent, interconnected agents that respond, experience, learn, and adapt.

C. IMPLICATIONS AND SIGNIFICANCE

By recognizing the interconnectedness of institutional, operational, facilitation, and criminal capabilities, both foreign and domestic, leaders and policy makers can at once understand that the characteristics of borders have and create global implications. Prior to this research, it was not readily understood the degree to which seemingly unrelated phenomena, such as perceptions of identity or foreign economic policy decisions, create fluctuations in border behaviors. The researcher believed economic interdependencies existed, but was surprised to discover the depth and breadth of social and cultural influences well beyond border regions. This discovery has the potential of completely reframing the function and reach of border security policies.

Through the study of border security in relation to CAS characteristics, a contribution has been made to furthering the fields of border security, national security, and foreign policy by providing additional theoretical insights into the study of borders. Contributing to the study of borders may provide policy makers the opportunity to apply a new method of sensing situational awareness, technique to draw associations between policy, perceptions, and behaviors, and a new perspective on what security programs are intended to achieve.

This thesis contributes to bridging a knowledge gap that exists in understanding the complexity of border security, dynamics that result in unintended consequences from and to foreign and domestic policies, and why measures of border security are so elusive. Furthermore, this thesis contributes to bridging the knowledge gap in making sense of how many divergent fields, such as psychology, defense, control, economy, globalization, and jurisdictional authority connect and relate to one another, at and around the border. This research can be used to expand the exploration of unconventional leverage points, better understand holistic implications of border policies, explore the institutionalization of systems thinking, and more broadly, improve sense making for homeland security.

As the border security complex continues to struggle with bridging "security" with "facilitation and growth," social groups throughout the world, in turn, struggle with the effects these issues place upon their safety and identity. The conceptual model of the

border CAS is one step towards understanding the consequences of these struggles, and towards better informing border security policy decisions. Additional research on the topic of globalization and socio-economics is necessary, however, before coherence can be reached.

D.   FUTURE RESEARCH

This thesis highlighted several additional areas in need of research. Models by their very nature are incomplete. They serve as snap-shots in time, of a select number of variables. That said, more sub-models need to be researched and constructed before the conceptual model is complete enough to render a useful border simulation model, to include financial systems, drug addiction, transportation systems, weak governments, mass migration, territorial occupations, natural resource dependencies and sources, and ideological networks. How can a territorial boundary, a geographically defined concept, influence and affect global, local, and corporate economies? Is globalization also a living CAS as well, or is it a complex adaptive system of systems (CASoS)? Can control and protection measures themselves be perceived as threats to "freedom, security, and way of life"? What messages does the border send to the globalized system, and vice versa?

If future research is conducted on the effects of globalization and socio-economics on identities and perceived fear, it may help determine whether the bordering phenomena described by Saskia Sassen affects the border CAS in any meaningful way, and if so, how and why. It may also assist in uncovering contributing root causes of radicalization. This research would likely provide insights into the driving factors behind transnationalism, and may aid in moving one step closer to identifying unconventional leverage points that could address the root causes of illegal and illicit cross-border behaviors.

E.   CONCLUSION

This thesis demonstrated that border security is a CAS. It demonstrated that the border is a living system, interconnected, interdependent, learning and evolving along with other global systems. The border CAS influences and is affected by social and cultural identities, and technological advancements, which is important because the

93

behavior of a CAS cannot be predicted, nor can it be controlled. This research is intended to provide a foundation from which coherence of borders and border security can be built; the conceptual model will not in itself achieve this end. The research focuses on historical context, perceptions, identity, and subjective threat. It does not describe all issues that affect border security, nor does it attempt to examine the logistical, legislative, jurisdictional, or legal constraints associated with border policies. Moreover, the conceptual model developed from this research is one-dimension and does not visually present the multi-layered, multi-dimensional ecosystem that borders and border security create. Finally, this thesis does not provide a prescriptive solution to border security, quantitative evidence, or regional variances of border dynamics.

Leaders must begin to ask, "security for whom exactly, and for which moral value specifically?"

By exploring how differing social, political, cultural, and moral influences affect crime rates at borders, leverage points will begin to emerge. Insights will be elucidated as to how policies affect disparate sub-systems, systems, and systems-of-systems. The ecosystems of trade, radicalization, foreign policy, identities, and technology will be understood to create many highly complex adaptive systems, interconnected and constantly evolving. This thesis was one small step towards that end.

VII. POST-CONCLUSION: MOVING FORWARD

This chapter is intended to provide the reader with usable recommendations to further develop, validate, and test the conceptual CAS model. The chapter concludes with suggested steps towards the institutionalization of systems thinking, government wide, which will enable wider application of the analytic and modeling techniques demonstrated throughout this thesis to other homeland security topics.

A. MODELING THE BORDER AS A LIVING SYSTEM

Conceptual (qualitative) modeling of the system, the agents, and their behavioral influences (values, perceptions, identities), will better inform the public and agency administrators of landscape complexity. Informational and learning feedback loops must accompany this model, as should stock and flow data (i.e., rates and levels). Once memorialized, computational simulation models (quantitative) can then be developed to test and further refine the concept.

Framing the "big picture" of agents, inter-dependencies, and associated dynamics of the complexity that is the border, will bring coherence to decision making and strategy.

Computational modeling and simulations are essential to provide empirical and statistically defensible probabilities. Demonstrating and testing the interdependencies and influences of social, cultural, geographic, functional, jurisdictional, value, and identity elements will turn the border security enterprise on its head, as not just geo-political border lines, fences, or technology, but systemic relationships. Sanctions creating institutional inadequacy, in turn, weakened governments; in turn, population needs not being met; in turn, population vulnerabilities leading to criminal influence, and in turn, resulting in increased violence, for example. The very concept of security, threat, and borders will need to be reassessed.

For this disruption to occur, a conceptual model must be computed, tested, re-tested, and validated. This testing and validation process will require contributions of a wide array of disciplinary skillsets, distillation of massive datasets, and the will of both public and private institutions to collaborate. A concerted effort will need to be made to

keep biases to a minimum, including assumptions regarding adversarial behaviors. This process and collaboration is possible, with independent sponsorship. Political, corporate, and lobby interests will prove a challenge.

1. Stakeholders

Stakeholders with vested interests in border security include government, private, public, and tribal organizations; anyone who has any jurisdiction, administrative responsibility, ownership, citizenship, profit, access, or sovereignty associated with borders. Municipal, state, and federal authorities, foreign governments, transnational and cartel networked organizations; private industry, civilians and military alike have a place in the modeling. Domestic entities entrusted with responsibilities within border environments range from local police departments and county sheriffs, public health officials, fire and emergency medical response organizations, private industries, elected officials and their supporting offices (at municipal, county, state, and federal levels), the Department of Defense, and disparate federal law enforcement and administrative agencies.

Those with interest in the output of modeling and simulation of the border system will be vast. Individual and organizational interests would likely be impacted by the findings, to include budgetary shifts, changes in contracts, staffing and infrastructure realignments, and impacts of voter base support of elected officials. Policies, laws, foreign agreements, and expenditures could be amended or rescinded, as insights are drawn regarding the leverage points within and around the border system. Stakeholders could conceivably span the globe.

2. Transformative Value

Observing characteristics of borders as an intersection of global landscapes, fraught with complexities well beyond predictability, calls into question the capacity of prevention. If system behaviors emerge unpredictably, threats to that system will be those things (or people) that could push the system from complexity to chaos. This concept, that prediction is untenable and control unachievable, could transform border security away from programs. What it would be transformed to is still an unknown, but programs,

such as fences, single-issue technology, and organizations with overlapping missions (e.g., TSA, CBP, USCG, ICE, USCIS), would have to be dismantled, merged, or reduced. Missions, such as immigration enforcement, customs enforcement, and drug enforcement are programs, focused on prediction and control. As mentioned numerous times throughout this thesis, behaviors, such as immigration, trade, crime terrorism, and enforcement, are created and reinforced by system dynamics. What environmental factors (natural, political, social, structural, economic, moral) influence these behaviors to occur? What creates the increases and decreases in these behaviors? What social, economic, cultural, religious, and political factors are affecting these behaviors? How do these behaviors change over time and space? These questions reflect systems thinking. The responses to these questions establish patterns. Understanding these patterns is sense making.

Demonstrating the complexity of the border security system through simulation will elucidate weaknesses of current policies and funding initiatives. Conceptual models are theoretical and abstract. They are a necessary first step; however, they are not useful unless converted into computation models that can run simulations to test the theory. Simulation models are mathematical and interactive and react to changes in variables entered by the user. These reactions will validate whether the rules of a model are accurate (when compared to historical cases), and provide a mechanism by which many different policy options can be tested to assess the probability of intended and unintended consequences should those policies be implemented.

Awareness of complexity and the inadequacy of current tools of management will necessarily lead into questioning "if not this, then what?" Systems thinking (interconnections, influences, controls, dynamics, and patterns; not parts and individuals) is one of many new tools required to navigate the complexities of the globalized 21st century. Awareness will expose the fear of stakeholders and alight vulnerabilities within current capabilities. This fear and absence of clarity and capacity will pose significant challenges in both the testing and validation process of systems analysis, should these efforts be perceived as challenging preferred policies and programs (power, identity, and profit).

This testing and validation process will require contribution of a wide array of disciplinary skillsets, distillation of massive datasets, and the will of both public and private institutions to collaborate. Complex systems with global interdependencies, such as border security, cannot be understood or tested in a vacuum. Financial (international transfers, wires, and bitcoin), transportation (interstate and international), agriculture (local, corporate, and multinational), immigration (all facets), radicalization, and free trade agreements are among just a few systems that intersect and influence border dynamics. Data analysts, engineers, sociologists, psychologists, and many other private and public professionals are necessary to ensure accuracy of information, and balanced research. A concerted effort will need to be made to keep biases to a minimum, including assumptions regarding adversarial behaviors. This process and collaboration is possible, with independent sponsorship. Political, corporate, and lobby interests will prove a challenge.

3.   Cost, Schedule, and Time

Budget figures to verify, test, and simulate the conceptual model of border security are unknown. Further, the process of institutionalizing system dynamics thinking skillsets throughout government will be an iterative process spanning years, jurisdictions, departments, and public and private sectors. Program costs to conduct verification, testing, and simulation functions will be incurred, to include staffing, grant, training, travel, and facilities costs. The figures for these costs are not readily identifiable at this early stage. Beyond implementation, overlaid costs of decommissioning programs, projects, and infrastructure found irrelevant from the findings of the system dynamics analysis will also be incurred.

Aside from direct financial costs, indirect costs may also be incurred, such as communications, reporting, networking, information sharing constraints, access to adversarial data, participant turnover, retention incentives, multi-national buy-in, and data warehousing issues.

The conceptual model will follow three distinct phases: development, testing, and simulation. These phases will be iterative and parallel, ending only when a verified and validated model is completed. From that point, the model will need to be periodically re-tested and re-calibrated as local and global dynamics change. The initial process could conceivably span a one-year schedule. This schedule estimate would be highly dependent upon the timely mitigation of risks and constraints.

Institutionalizing system dynamics skillsets throughout government will follow a much longer schedule. This process will also follow an iterative process, by agency, department, locale, prioritization of job classifications, and availability of training and travel budgets. It is conceivable that initial training could be achieved holistically within five years. Refresher and periodic monitoring of skillset application will overlay the primary training schedule, and continue on well beyond the five-year initiative.

Steps to make progress towards comprehensive modeling of the border CAS

1. Initial conceptual model
2. Conversion of model into initial computational model
3. Test model with single issue; note gaps and strengths
4. Test model with multiple issues; note gaps and strengths
5. Test model with competitive issues; note gaps and strengths
6. Expand upon sub-models with subjects found relevant to bridge gaps
7. Re-calibrate conceptual and computation model
8. Repeat steps 3–7 until results render confidence in model integrity
9. Memorialize rules and data points
10. Continually test with current events, adapting rules as the CAS evolves

Steps to make progress towards the institutionalization of system thinking skillsets

1. Identify stakeholders and prospective students
2. Map budgetary, procedural, fiscal, and jurisdictional constraints that could infringe on education
3. Identify execution platform (e.g., classroom, virtual, scenario, gaming, hybrid, etc.)
4. Develop educational program (direct and indirect requirements)
5. Source curriculum developers and instructors
6. Develop curriculum
7. Structure curriculum platforms
8. Select pilot group of students and test curriculum
9. Re-calibrate curriculum and platform per feedback

10. Initiate whole-of-government interactive curriculum, and management transition
11. Develop refresher and advanced curriculum and execution platform(s)
12. Monitor performance of students, before and after education
13. Monitor governance performance, as systems thinking tools are applied to policy

4. Probable Opposition and Conflicting Agendas

Policies, laws, foreign agreements, and expenditures could be amended or rescinded, as insights are drawn regarding the leverage points within and around the border system. Opposition would likely come from two directions, political and financial. System dynamics and complexity thinking instill insights that many, if not most, threats are interconnected and influenced by many disparate and counterintuitive sources. Patterns of behavior and leverage points, not programs, will be the new security paradigm and will likely result in program officials and staff perceiving loss of power, budget, control, and purpose. Moreover, campaign agendas will be contradicted and challenged. Politicians often campaign on single issues. If single issues are found to be effects, not sources, of social problems, voter base polls may be impacted contrary to the desired direction of politicians, lobbyists, interest groups, and industrial complexes. Appointed administrators and senior leaders, who are beholden to the whims of elected officials, may also represent conflicting agendas. Unions will also present a conflict, in an effort to protect members who are employed based upon the interpretation of a need for a single-issue capacity, such as border patrol, and customs. Another conflict will likely arise from private industry that makes millions in profit from government contracts focused upon traditional, linear security programs.

B. DIGGING DEEPER, THINKING BROADER, CHALLENGING THE STATUS QUO

Specific topics need to be explored, data collected, and tested via simulation to establish empirical models of broader and deeper border security dynamics. These simulations would contribute to analysis of existing policies, produce statistical cost-benefit analysis, and test alternative leverage points. Some of these topics include the following.

- U.S. military support in Central and South America, genocide and TCO expansion

- Non-intrusive inspection equipment, physical inspection and human trafficking

- Southwest border fence, illegal migrants and TCO violence

- Tethered aerial surveillance blimps, defense corporations and border violence

- Automated manifest programs, small business impact and local economies

- Commercial agriculture, NAFTA, Mexican farmers and illegal migration

Testing issues within a border CAS simulation can feasibly extend infinitely. The first, most important future research needed as of this thesis, is to incorporate the employment, globalization, and economic links noted in previous chapters, and verify and validate the conceptual model. Once a foundational simulation is available, policies can be tested and statistically analyzed, and additional rules added to the model as research continues.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

Theorist	Principles	Property	Mechanism	Field(s)
John H. Holland (1975, 1992, 1995)	Non-linear Interactions	Aggregation	Parellelism (tagging)	Molecular Biology Evolutionary Biology
	Aggregate Behavior	Nonlinearity	Competition (internal models)	
	Change	Flows	Recombination (building blocks)	
	Anticipation	Diversity	▨▨▨▨▨▨▨▨	

Theorist	Cyclic Behavioral Elements	Lifecycle Issues	Field(s)
Murray Gell-Mann (1994, 1995)	Course Graining	Time Scales	Chemistry Molecular Biology Evolutionary Biology Immunology Learning Theory Mathematics Computer Science Pyschology Economics Anthropology Archaeology Linguistics History Physics
	Identification	System is a component of other systems	
	Compression	Systems with humans in the loop	
	Variation	System composed of many other co-adapting systems	
	Application Selection	▨▨▨▨▨▨▨▨▨▨	

Theorist	Principles	Property	Mechanism	Field(s)
W. Brian Arthur (1997)	Dispersed Interaction	Anticipation and Aggregation	Parellelism (emergence)	Economics Molecular Biology Evolutionary Biology
	No Global Controller	Independence	Competition and Coordination	
	Crosscutting Hierarchical Interaction	Tangled and Crosscutting	Building blocks	
	Continual Adaptation	Adaptation	Revision by Experience	
	Perpetual Novelty	Continual Change	Exploration	
	Out-of-Equilibrium Dynamics	Non-optimized Operation	Improvement	

Theorist	Principles	Description	Field(s)
Simon A. Levin (1998)	Diversity	Sustained Individuality	Ecology Economics Molecular Biology Evolutionary Biology
	Local Interactions	Inter-component	
	Selection	Autonomous Replication or Enhancement	

Adapted from Jason Brownlee (2007) and Murray Gell-Mann (1992)

Table 2.　　Comparative Summaries of Holland, Gell-Mann, Arthur, and Levin.[172]

---

[172] Data sourced and adapted from Brownlee, *Complex Adaptive Systems*, 1–3.
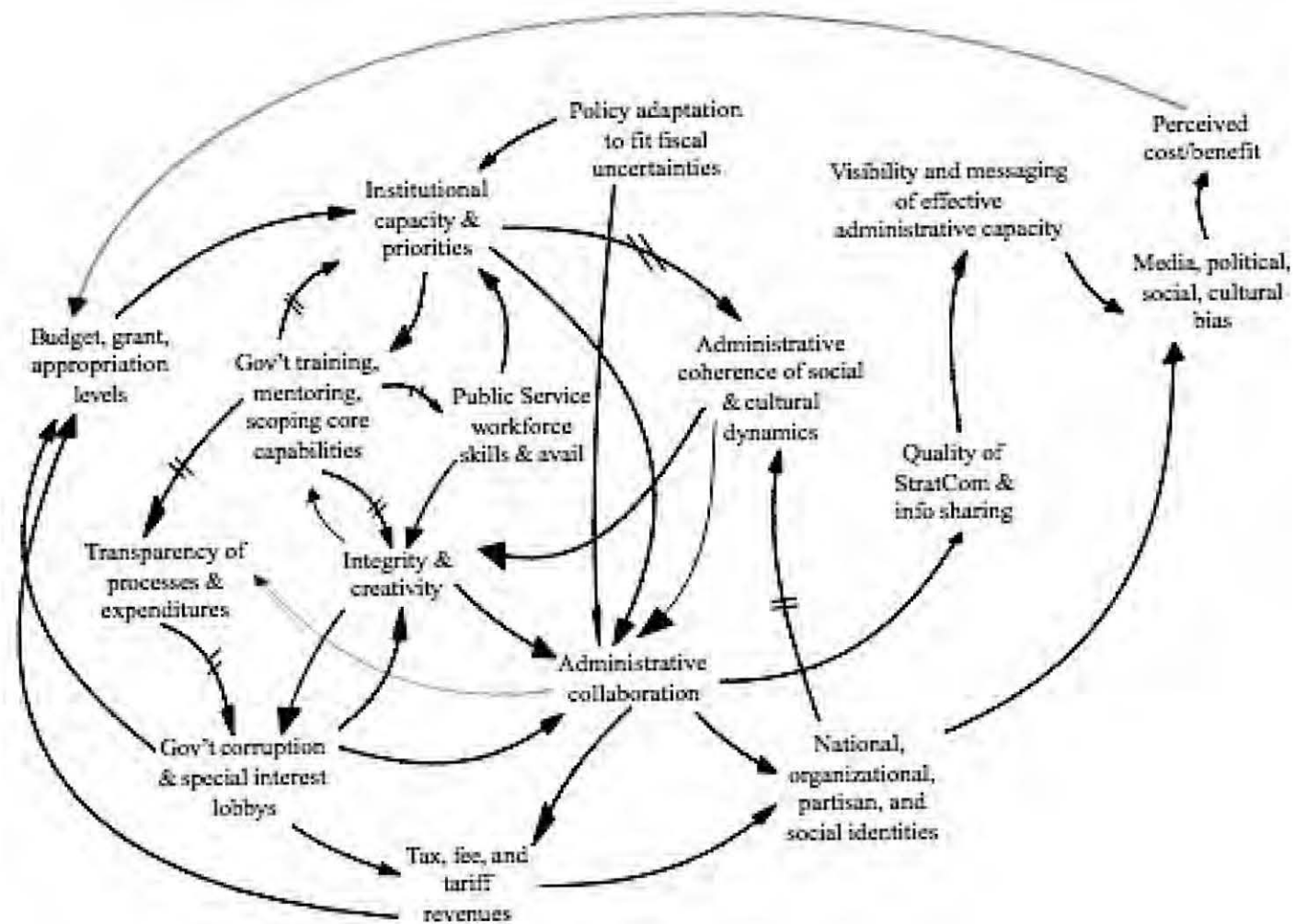
103

THIS PAGE INTENTIONALLY LEFT BLANK

Figure 8.   Institutional Capacity and Priorities Pillar
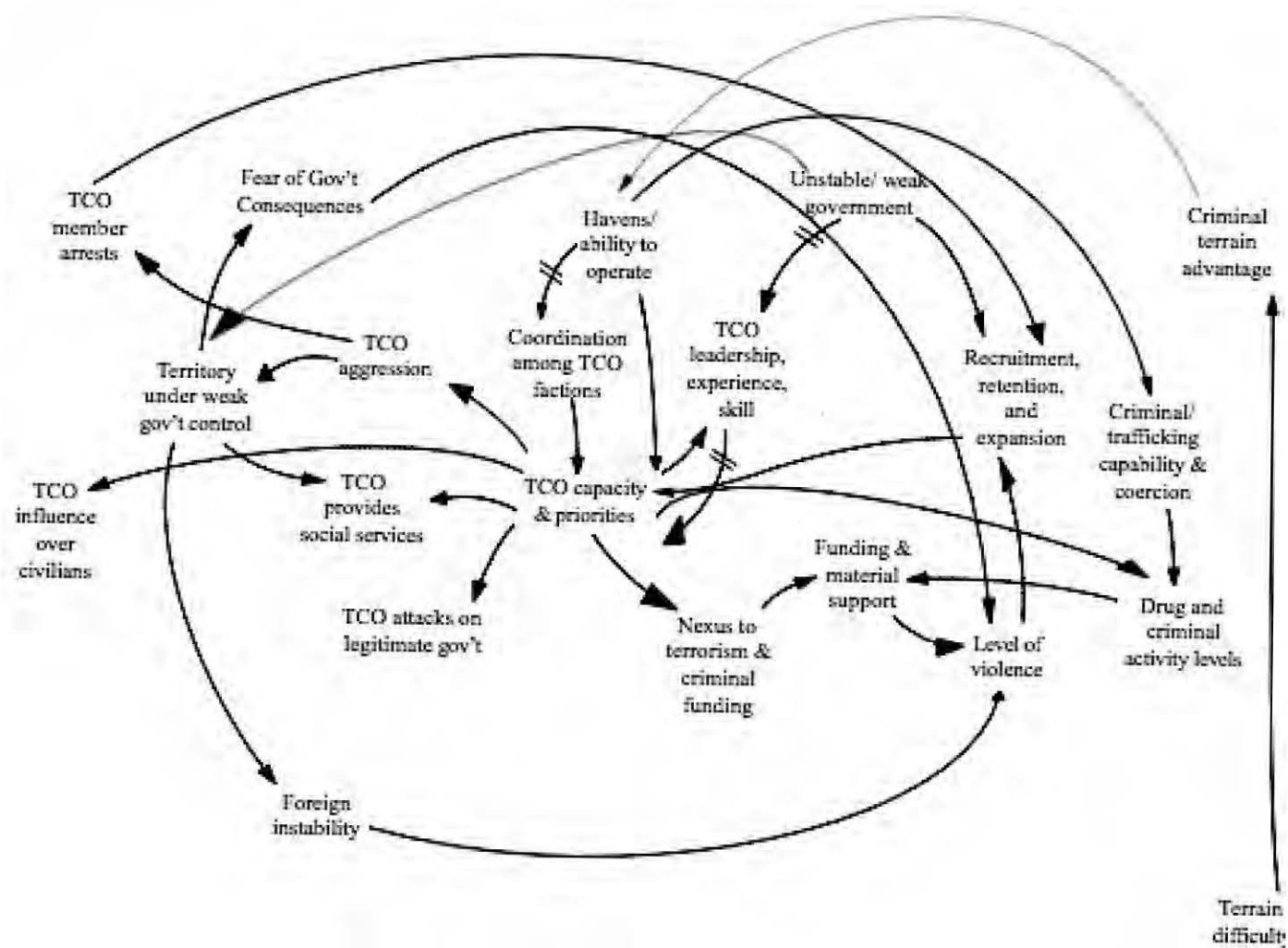
THIS PAGE INTENTIONALLY LEFT BLANK

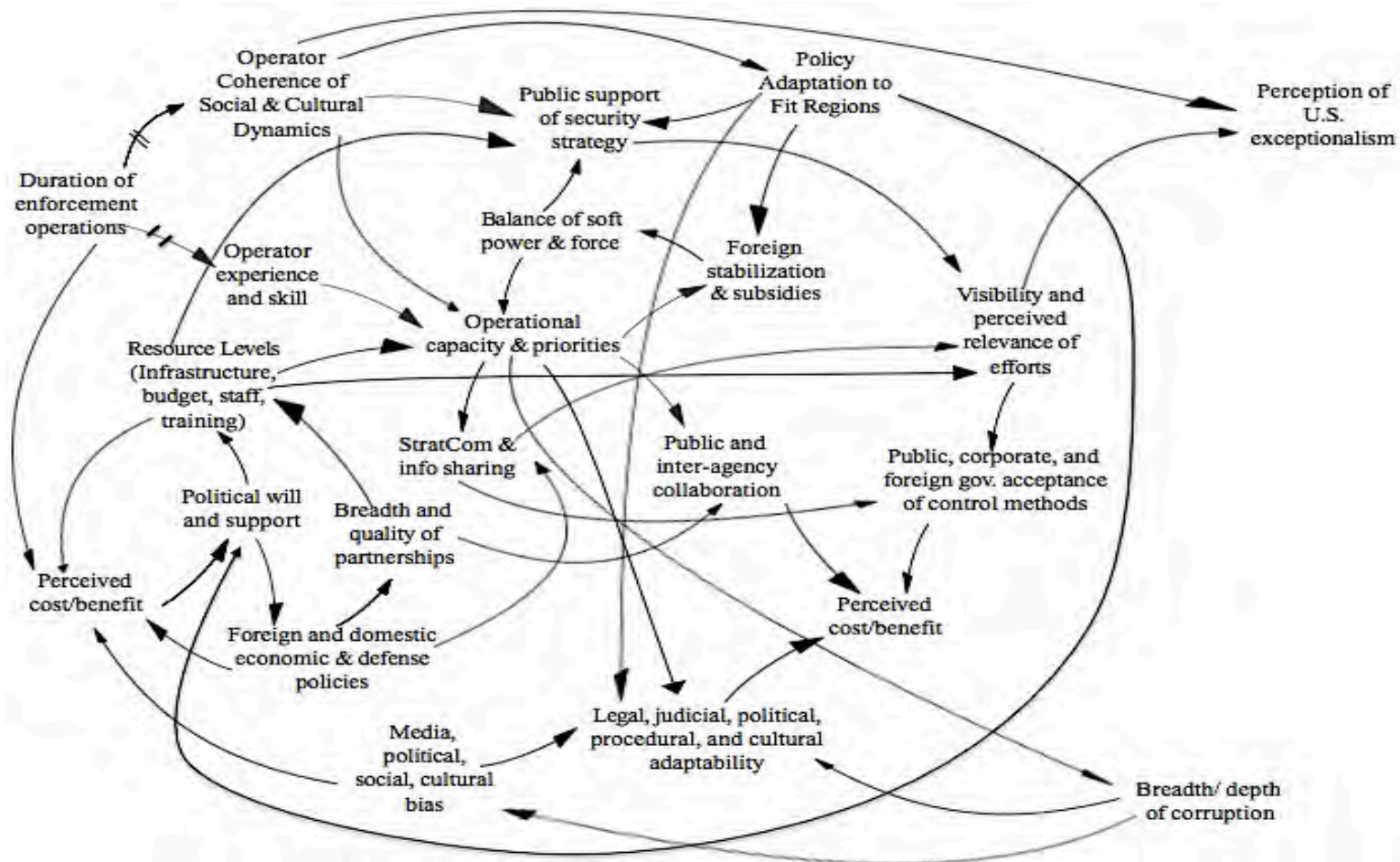Figure 9.   TCO Capacity and Priorities Pillar

THIS PAGE INTENTIONALLY LEFT BLANK

Figure 10.   Operational Capacity and Priorities Pillar
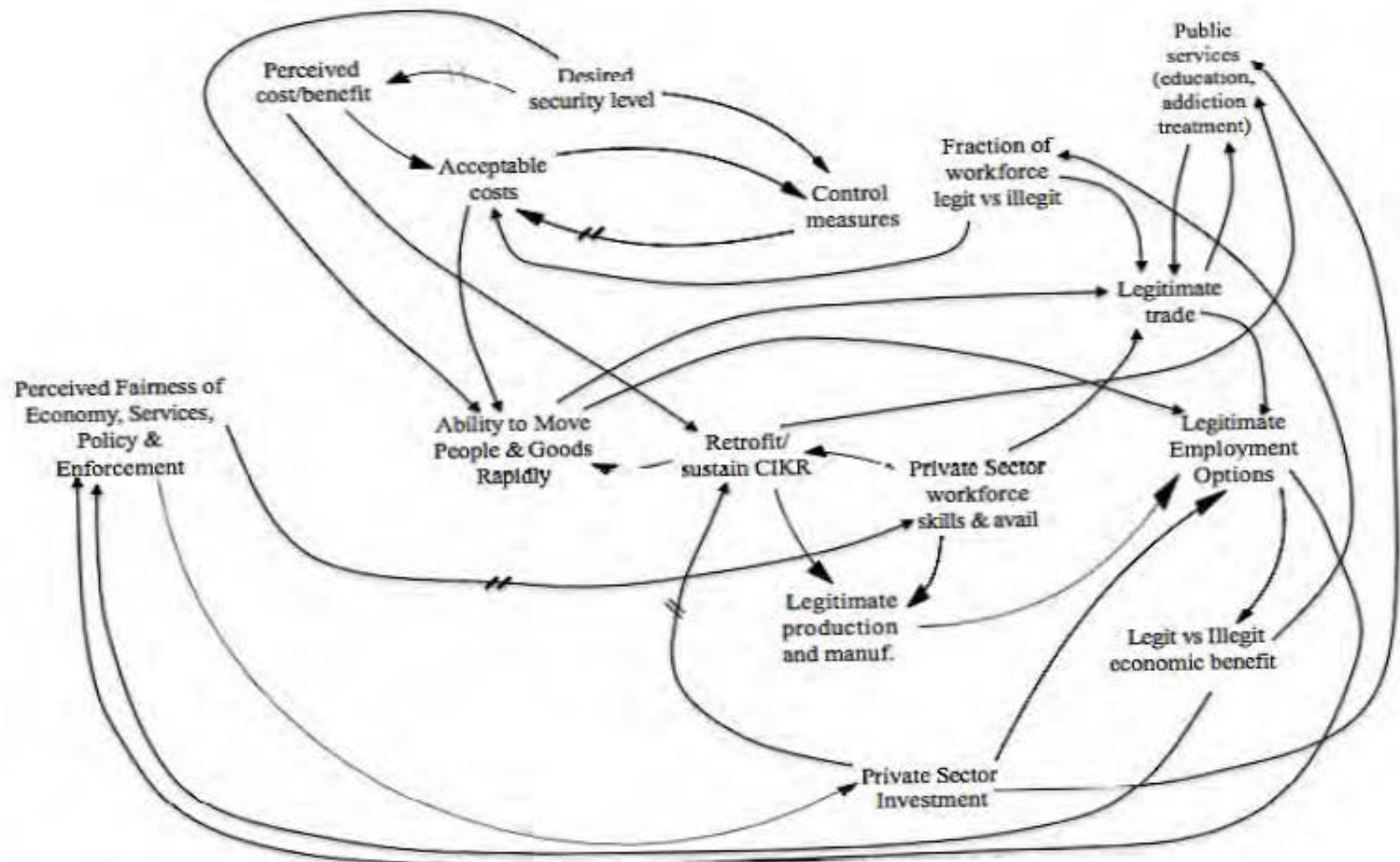
THIS PAGE INTENTIONALLY LEFT BLANK

Figure 11. Ability to Move Goods and People Rapidly Pillar

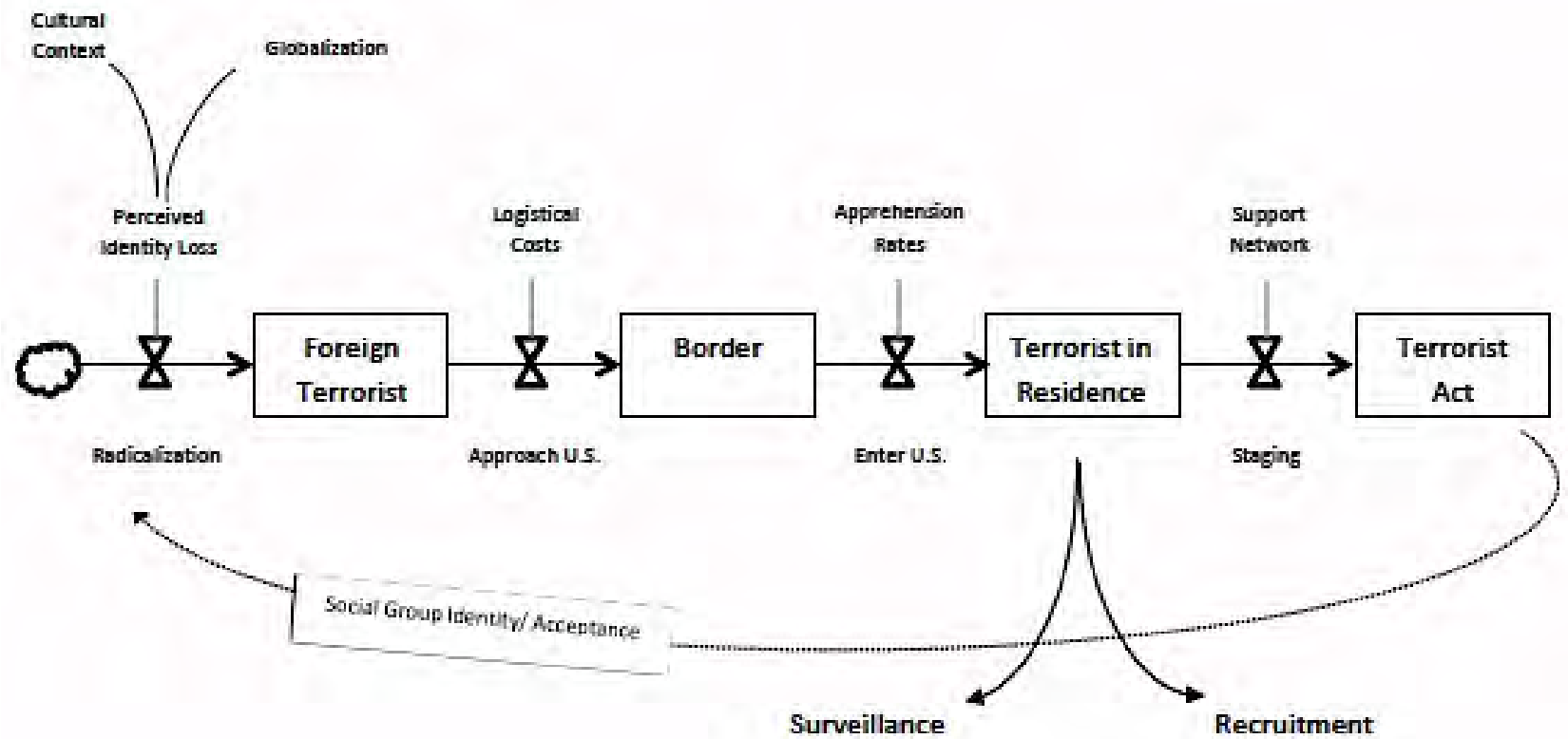THIS PAGE INTENTIONALLY LEFT BLANK

Figure 12.   Terrorist Stock and Flow

THIS PAGE INTENTIONALLY LEFT BLANK
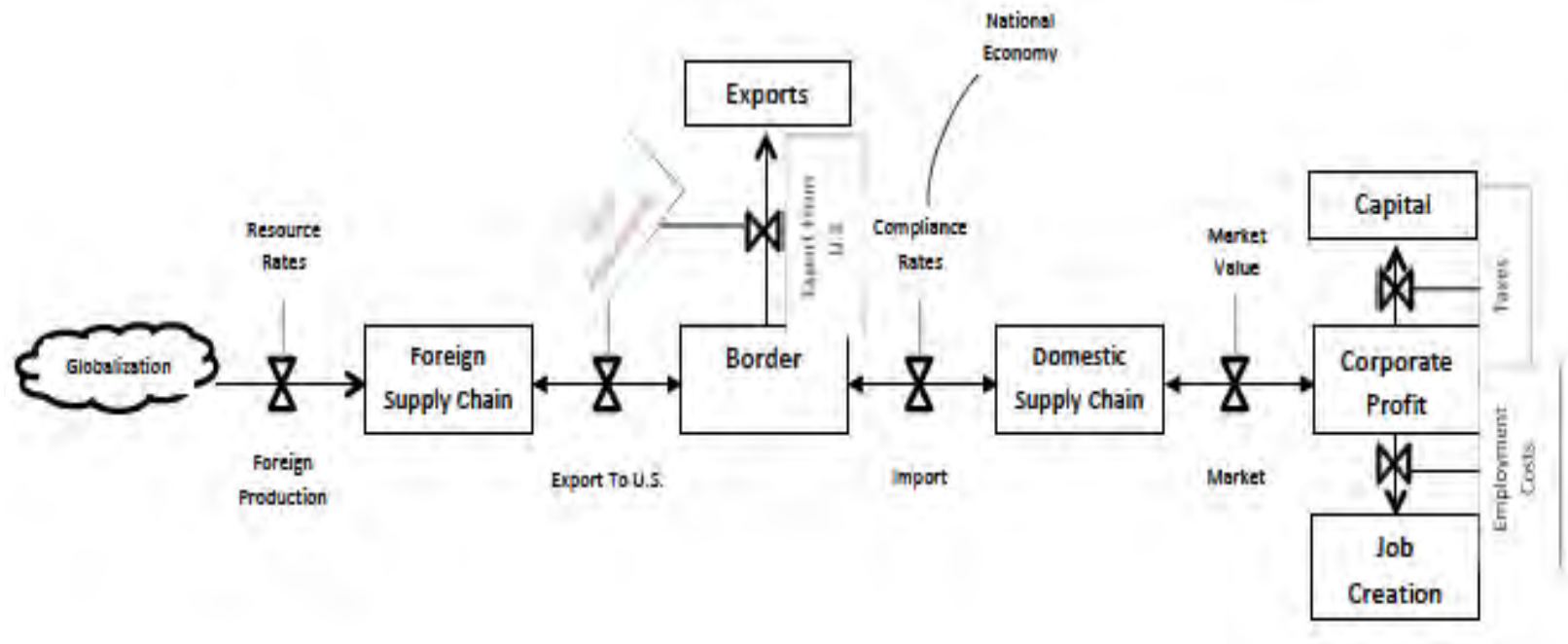
APPENDIX G.

Figure 13.   Trade Stock and Flow

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Abbott, Thomas K., trans. "Answer to the Question: What is Enlightenment?" in *Basic Writings of Kant*, edited by Allen W. Wood, 133-141. New York: The Modern Library, 2001.

Alden, Edward. *The Closing of the American Border: Terrorism, Immigration, and Security Since 9/11*. New York: Harpers Collins Publishers, 2008.

Andreas, Peter. "Redrawing the line: Borders and Security in the Twenty-First Century." *International Security* 28, no. 2 (Fall 2003): 78–111. http://www.brown.edu/ Departments/Political_Science/documents/Redrawing_the_Line.pdf.

Aslan, Reza. *Beyond Fundamentalism*. New York: Random House Trade Paperback, 2010.

Baldwin, David A. "The Concept of Security." *Review of International Studies* no. 23 (1997): 5–26.

Becker, Andres, G. W. Schulz, and Tia Ghose. "Four of Five Border Patrol Drug Busts Involve U.S. Citizens." *The Center for Investigative Reporting*, March 26, 2013. http://cironline.org/reports/four-five-border-patrol-drug-busts-involve-us-citizens-records-show-4312.

Beerel, Annabel. *Leadership and Change Management*. Thousand Oaks, CA: Sage Publications, 2009. http://www.sagepub.com/upm-data/27451_02_Beerel_ Ch_02.pdf.

Beljan, Robert. "Afghanistan: Lessons Learned from an ISAF Perspective." *Small Wars Journal*, May 30, 2013. http://smallwarsjournal.com/jrnl/art/afghanistan-lessons-learned-from-an-isaf-perspective.

Bellavita, Christopher. "Changing Homeland Security: Shape Patterns, Not Programs." *Homeland Security Digital Library*, October 2006.

Beutler, Brian. "Napolitano: Border Security Trigger 'Not the Way To Go' In Immigration Reform." *TPMDC*, March 26, 2013. http://tpmdc.talkingpoints memo.com/2013/03/napolitano-border-security-trigger-not-the-way-to-go-in-immigration-reform.php.

Brannan, David W., Phillip F. Esler, and N. T. Strindberg. "Talking to "Terrorists:" Towards an Independent Analytical Framework for the Study of Violent Substate Activism." *Studies in Conflict & Terrorism* 24, no. 1 (2001): 3–24.

Brownlee, Jason. *Complex Adaptive Systems*, Technical Report 070302A, Complex Intelligent Systems Laboratory. Melbourne, AUS: Swinburne University of Technology, 2007.

Burt, Michael. "Tighter Border Security and Its Effect on Canadian Exports." *Canadian Public Policy* 35, no. 2 (June 2009): 149–169.

Businessdictionary.com. "Factors of Production." (n.d.). http://www.business dictionary.com/definition/factors-of-production.html.

Canada Border Services Agency. "Free and Secure Trade Program Factsheet." (n.d.). http://www.cbsa-asfc.gc.ca/media/facts-faits/027-eng.html.

Capra, Fritjof. *The Web of Life: A New Scientific Understanding of Living Systems*. New York: Anchor Books, 1997.

Clarke, Simon. "Culture and Identity." *The Sage Handbook of Cultural Analysis*. 2008, August 8, 2011. http://www.sagepub.com/healeyregc6e/study/chapter/ency carticles/ch01/CLARKE~1.PDF.

C-SPAN. "House Cmte. Examines Terrorist Abuse of Refugee Programs." Washington, DC, December 4, 2012. http://www.c-span.org/Events/House-Cmte-Examines-Terrorist-Abuse-of-Refugee-Programs/10737436276-1/.

Dalton, Angela, and Victor Asal. "Is It Ideology or Desperation: Why Do Organizations Deploy Women in Violent Terrorist Attacks?" *Studies in Conflict & Terrorism* 34, no. 10 (2011): 802–819.

Danelo, David J. *Toward A U.S.-Mexico Security Strategy: The Geopolitics of Northern Mexico and the Implications for U.S. Policy*. Philadelphia, PA: Foreign Policy Research Institute, 2011. https://www.fpri.org/docs/Toward_a_US_Mexico_ Security_Strategy_Danelo.pdf.

Desai, Anand. "Adaptive Complex Enterprises." *Communications of the ACM-Adaptive Complex Enterprises*. Special Issue 48, no. 5 (May 2005): 32–35.

Dodder, Rebecca, and Robert Dare. *Complex Adaptive Systems and Complexity Theory: Inter-related Knowledge Domains*. Cambridge: MA: Massachusetts Institute of Technology, 2000. http://web.mit.edu/esd.83/www/notebook/ComplexityKD .PDF.

Executive Office of the President of the United States. "Outlines of the Trans-Pacific Partnership (TPP)." Office of the United States Trade Representative, November 2011. http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/ outlines-trans-pacific-partnership-agreement.

Flynn, Stephen E. "Port Security Is Still a House of Cards." Center for National Policy. *Far Eastern Economic Review*, January/February 2006. http://cnponline.org/ht/display/ContentDetails/i/16643/pid/.

Food & Water Watch. "Import Alert: Government Fails Consumers, Falls Short on Seafood Inspections." July 2007. http://www.safeharborfoods.com/fish-mercury-resources/Food-WaterWatch-ImportAlert7-07.pdf.

Forest, James J. "Kidnapping by Terrorist Groups, 1970–2010: Is Ideological Orientation Relevant?" *Crime & Delinquency* 58, no. 5 (September 2012): 769–797.

Garcia, Joseph. "On the U.S.-Mexico Border, What Does 'Secure' Mean?" *azcentral.com*, July 28, 2013. http://www.azcentral.com/opinions/articles/20130726us-mexican-border-secure-mean.html.

Gell-Mann, Murray. "Complexity and Complex Adaptive Systems." in *The Evolution of Human Languages. SFI Studies in the Sciences of Complexity*, Proceedings*, X: 3–18, edited by J. A. Hawkins and M. Gell-Mann. Reading, MA: Addison-Wesley, 1992. http://tuvalu.santafe.edu/~mgm/Site/Publications_files/MGM%20107.pdf.

Gongloff, Mark. "So Much Corporate Cash, So Little Use: Seven and a Half Things to Know." *The Huffington Post*, March 8, 2013. http://www.huffingtonpost.com/2013/03/08/seven-and-a-half-things-you-need-to-know_n_2833227.html.

Graham, Marty. "Napolitano Touts U.S. Border Security Gains Despite More Arrests." *Reuters*, February 5, 2013. http://www.reuters.com/article/2013/02/05/us-usa-napolitano-border-idUSBRE9140AF20130205.

Haddal, Chad C. *Border Security: The Role of the U.S. Border Patrol*. CRS Report RL32562. Washington, DC: Library of Congress, Congressional Research Service, July 30, 2010.

Heifetz, Ronald. Alexander Grashow, and Marty Linsky. *The Practice of Adaptive Leadership: Tools and Tactics for Changing Your Organization and the World*. Watertown, MA: Harvard Business Press, 2009.

Heyman, Josiah McC. *Guns, Drugs, and Money: Tackling the Real Threats to Border Security*. Washington, DC: American Immigration Council, Immigration Policy Center, 2011. http://www.immigrationpolicy.org/sites/default/files/docs/Heyman_-_Drugs_Guns_and_Money_091211.pdf.

Hill, blog, The. http://thehill.com/blogs/congress-blog/economy-a-budget/278327-strengthening-cross-border-trade-with-canada.

House Committee on Homeland Security. "McCaul Border Security Guiding Principles and Opening Statement on Hearing: A New Perspective on Threats to the Homeland." February 13, 2013. http://homeland.house.gov/press-release/mccaul-border-security-guiding-principles-and-opening-statement-hearing-new.

———. "Subcommittee Hearing: Terrorist Exploitation of Refugee Programs." Subcommittee on Counterterrorism and Intelligence. Washington, DC, December 4, 2012, 10:00 a.m. http://homeland.house.gov/hearing/subcommittee-hearing-terrorist-exploitation-refugee-programs.

———. *A Line in the Sand: Confronting the Threat at the Southwest Border*. Subcommittee on Investigations. Washington, DC: 2006. http://www.house.gov/sites/members/tx10_mccaul/pdf/Investigaions-Border-Report.pdf.

Hudson, Scott. "Overview of U.S. Government Security Initiatives." *Poole College of Management Supply Chain Resource Cooperative*, January 31, 2006. http://scm.ncsu.edu/scm-articles/article/overview-of-us-government-security-initiatives.

Huysmans, Jef. "Security! What Do You Mean? From Concept to Thick Signifier." *European Journal of International Relations* 4, no. 2 (June 1998): 226–255.

Intellectual Property Rights Coordination Center. "Home." (n.d.). http://www.iprcenter.gov/.

Jones, Vivian C., and Marc R. Rosenblum. *U.S. Customs and Border Protection: Trade Facilitation, Enforcement, and Security*. CRS Report R43014. Washington, DC: Library of Congress, Congressional Research Service, March 22, 2013. http://www.fas.org/sgp/crs/homesec/R43014.pdf.

Juarrero, Alicia. "Complex Dynamical Systems Theory." *Cognitive Edge Network*, 2010. http://cognitive-edge.com/uploads/articles/100608%20Complex_Dynamical_System_Theory.pdf.

Kelsey, Jane, and Lori Wallack. "Investor-State" Disputes in Trade Pacts Threaten Fundamental Principles of National Judicial Systems." *School of Law, The University of Auckland, New Zealand and Public Citizen's Global Trade Watch Division*. Washington, DC, April 2012. http://tpplegal.files.wordpress.com/2012/05/isds-domestic-legal-process-background-brief.pdf.

Khanlarzadeh, Mina. "The Effects of the Economic Sanctions Against Iran." *Jadaliyya*, July 26, 2013. http://www.jadaliyya.com/pages/index/13200/the-effects-of-the-economic-sanctions-against-iran.

Kinnvall, Catarina. "Globalization and Religious Nationalism: Self, Identity, and the Search for Ontological Security." *Political Psychology* 25, no. 5 (2004): 743. http://identities.org.ru/readings/Religion_globalsiation_and.pdf.

Kriesberg, Louis. "Identity Issues." *Beyond Intractability*, edited by Guy Burgess and Heidi Burgess, Conflict Information Consortium, University of Colorado, Boulder, July 2003. http://www.beyondintractability.org/essay/identity-issues.

Kurtz, Cynthia F., and David J. Snowden. "The New Dynamics of Strategy: Sense-making in a Complex and Complicated World." *IBM Systems Journal* 42, no. 3 (2003): 462–483.

Lake, Jennifer E. *Border and Transportation Security: Overview of Congressional Issues*. CRS Report RL32705. Washington, DC: Library of Congress, Congressional Research Service, 2004.

Laksmi, Rama. "Indian Information Technology Firms Say Border Security Bill Is Protectionist." *Washington Post*, August 6, 2010. http://www.washington post.com/wp-dyn/content/article/2010/08/06/AR2010080604068.html.

Le Billon, Philippe. "The Geopolitical Economy of 'Resource Wars'." *Geopolitics* 9, no. 1 (March 2004): 1–28. http://www.neiu.edu/~dgrammen/2004LEBILLON.pdf.

Lee, Wenke, and Bo Rotoloni. "Emerging Cyber Threats Report 2013." *Georgia Institute of Technology*. Report presented by the Georgia Tech Information Security Center and the Georgia Tech Research Institute at the annual Georgia Tech Cyber Security Summit, Atlanta, Georgia, October 11, 2011.

Lerche, Charles O. III. "The Conflicts of Globalization." *The International Journal of Peace Studies* 3, no.1 (January 1998). http://www.gmu.edu/programs/icar/ijps/vol3_1/learch.htm.

Library of Congress. "Articles of Confederation." Primary Documents in American History. (n.d.). http://www.loc.gov/rr/program/bib/ourdocs/articles.html.

Macmillandictionary.com. "Threat." Accessed September 5, 2013. http://www.macmillandictionary.com/us/dictionary/american/threat.

Mahan. Sue, and Pamala L. Griset. *Terrorism in Perspective*, 2nd ed. Los Angeles, CA: Sage Publications, 2008.

Maril, Lee. "The Border Fear Index: How to Measure Border Security." *Homeland Security Newswire*, December 16, 2011. http://www.homelandsecuritynews wire.com/dr20111216-the-border-fear-index-how-to-measure-border-security.

Marketplace. "The Breakdown: The Ripple Effects of Unemployment." Marketplace Podcast, Hosted by Kai Ryssdal, September 17, 2011. http://www.marketplace. org/topics/business/breakdown/breakdown-ripple-effects-unemployment.

McBride, Megan K. "The Logic of Terrorism: Existential Anxiety, the Search for Meaning, and Terrorist Ideologies." *Terrorism & Political Violence* 23, no. 4 (2011): 560–581.

McLaughlin, Seth. "Napolitano Says Border Is Secure, Though Proof Is Lacking No Clear Measure Could Scuttle Immigration." *Washington Times*, March 3, 2013. http://www.washingtontimes.com/news/2013/mar/26/napolitano-says-border-is-secure-though-proof-is-l/?page=all.

Meckler, Laura. "Defining Border Security Key to Senate Immigration Talks." *The Wall Street Journal*, Updated February 1, 2013. http://online.wsj.com/news/articles/SB10001424127887323926104578278240287317724.

Michitaka, Nakatomi. "Improving Global Supply Chains by an Issues-Based Plurilateral Approach." Concept Paper for an International Supply Chain Agreement (ISCA). Research Institute of Economy, Trade and Industry, October 29, 2012. http://www.ide.go.jp/Japanese/Event/Sympo/pdf/2013wto_nakatomi01.pdf.

Minsky, Hyman P. "Global Consequences of Financial Deregulation." *Hyman P. Minsky Archive*, Paper 378 (October 2, 1986). http://digitalcommons.bard.edu/hm_archive/378

Mitchell, Melanie. *Complex Systems: Network Thinking*, Working Paper 2006-10-036. Santa Fe, NM: Santa Fe Institute, 2006.

Moghaddam, Fathali M. *How Globalization Spurs Terrorism: The Lopsided Benefits of "One World" and Why That Fuels Violence*. Westport, CT: Praeger Security International, 2008. Kindle edition.

———. *Multiculturalism and Intergroup Relations*. Washington, DC: American Psychological Association, 2008.

———. *The New Global Insecurity: How Terrorism, Environmental Collapse, Economic Inequalities, and Resource Shortages Are Changing Our World*. Santa Barbara, CA: Praeger, 2010. Kindle edition.

Moodley, Kiran. "WTO Warns of Trade Slowdown Due to Protectionism." *CNBC*. Reported by Steve Sedgwick, September 6, 2013. http://www.cnbc.com/id/101014240.

Mueller, John, and Karl Mueller. "Sanctions of Mass Destruction." *Foreign Affairs*, May 1, 1999. http://www.foreignaffairs.com/articles/55009/john-mueller-and-karl-mueller/sanctions-of-mass-destruction.

Nawaz, Maajid. *Radical: My Journey out of Islamist Extremism*. Guilford, CT: Lyons Press, 2013.

Office of Inspector General. "Free and Secure Trade Program-Continued Driver
    Eligibility." Department of Homeland Security, Report OIG-12-84, May 2012.
    http://www.oig.dhs.gov/assets/Mgmt/2012/OIG_12-84_May12.pdf.

Oxforddictionaries.com. "Border." Accessed September 5, 2013.
    http://oxforddictionaries.com/us/definition/american_english/border.

Oxforddictionaries.com. "Threat." Accessed September 5, 2013.
    http://www.oxforddictionaries.com/us/definition/american_english/threat?q=threat.

Packer, Corinne, Ronald Labonté, and Vivien Runnels. "Globalization and the Cross-
    Border Flow of Health Workers." In *Globalization and Health: Pathways,*
    Evidence and Policy, edited by R. Labonte, T. Schrecker, C. Packer, and V.
    Runnels. New York: Routledge, 2009. http://www.globalhealthequity.ca/elect
    ronic%20library/Globalization%20and%20the%20Cross-Border%20Flow%20of
    %20Health%20Workers.pdf.

Peaco, Ed. "Ice Partnering to Fight Crime on a Global Scale." American Board for
    Certification in Homeland Security. (n.d.). http://www.abchs.com/ihs/SUMMER
    2012/ihs_articles_cover.php.

Plato. *Republic*. Translated by Benjamin Jowett (1871). New York: Barnes and Noble
    Classics, 2004.

Plumer, Brad. "Border Security Is the Key to Immigration Reform. So How Do We
    Measure It?" *Washington Post WONKBLOG*, June 21, 2013. http://www.wash
    ingtonpost.com/blogs/wonkblog/wp/2013/06/21/border-security-is-the-key-to-
    immigration-reform-so-how-do-we-define-it/.

Powell, Stewart. "Changing the Definition of "Border Security" Could Be Key to
    Immigration Overhaul." *Houston Chronicle*, February 27, 2013. http://blog.chron.
    com/txpotomac/2013/02/changing-the-definition-of-%E2%80%9Cborder-
    security%E2%80%9D-could-be-key-to-immigration-overhaul/.

Prewitt, James E., Dick Weil, and Anthony Q. McClure. "A Complex Adaptive Systems
    Approach to Strategic Planning." *Asian Journal of Business and Management*
    Sciences 1, no. 11 (2012): 94–99. http://www.ajbms.org/articlepdf/ajbms201211
    i11111.pdf.

Public Citizen, Eyes on Trade-Blog on Globalization and Trade. "Corporations Now
    Using Foreign Tribunals to Attack Domestic Court Rulings." October 16, 2013.
    http://citizen.typepad.com/eyesontrade/2013/10/investors-are-increasingly-
    challenging-states-constitutional-court-decisions-in-investor-state-tribu.html.

Reves, Emery. *The Anatomy of Peace*. New York: Harper & Brothers Publishers, 1945.

Rheannon, Francesca. "Red Light On Green: How International Trade Tribunals Threaten Sustainability and Green Business." *Corporate Social Responsibility Newswire*, June 13, 2013. http://www.csrwire.com/blog/posts/886-red-light-on-green-how-international-trade-tribunals-threaten-sustainability-and-green-business.

Riley, Ben, and Kathleen Kiernan, eds. "The "New" Face of Transnational Crime Organizations (TCOs): A Geopolitical Perspective and Implications to U.S. National Security." *Kiernan Group Holdings*, March 2013, https://www.hsdl.org/?view&did=733208.

Robinson, Courtney. "Counterfeit Electronics-A Dangerous Growing Problem." *www.abc-7.com*. May 22, 2013. http://www.abc-7.com/story/22401977/counterfeit-electronics-a-dangerous-growing-problem.

Rosenblum, Marc R. *Border Security: Immigration Enforcement Between Ports of Entry*. CRS Report R42138. Washington, DC: Library of Congress, Congressional Research Service, 2012. http://fpc.state.gov/documents/organization/180681.pdf.

Rosenblum, Marc C., Jerome P. Bjelopera, and Kristen M. Finklea. *Border Security: Understanding Threats at U.S. Borders*. CRS Report R42969. Washington, DC: Library of Congress, Congressional Research Service, 2013. http://trac.syr.edu/immigration/library/P7167.pdf.

Rothschild, Emma. "What is Security?" *Daedalus* 124, no. 3. The Quest for World Order (Summer 1995): 53–98. http://www.jstor.org/stable/2002731.

Rozemberg, Hernan. "9/11 Linked Immigration with Border Security, Anti-Terrorism." *Fronteras*, September 11, 2011. http://www.fronterasdesk.org/content/911-linked-immigration-border-security-anti-terrorism.

Saba, Anne. "The U.S. Customs Service." *U.S. Customs Today*, February 2003. http://www.cbp.gov/xp/CustomsToday/2003/February/always.xml.

Sageman, Marc. *Understanding Terror Networks*. Philadelphia, PA: University of Pennsylvania Press, 2004.

Salter, Mark B., and Can E. Mutlu. "Psychoanalytic Theory and Border Security." *European Journal of Social Theory* 15, no. 2 (May 2012): 179–195.

Sassen, Saskia. "When National Territory is Home to the Global: Old Borders to Novel Borderings." *New Political Economy* 10, no. 4 (December 2005): 523. http://www.saskiasassen.com/PDFs/publications/When-National-Territory-is-Home-to-the-Global.pdf.

Savitz, Eric. "The Serious Risks from Counterfeit Electronic Parts." *Forbes*, July 11, 2012. http://www.forbes.com/sites/ciocentral/2012/07/11/the-serious-risks-from-counterfeit-electronic-parts/2/.

Shemella, Paul, ed. *Fighting Back: What Governments Can Do About Terrorism.* Stanford, CA: Stanford University Press, 2011.

Shindell, Matthew R., Todd Kramer, and Stanely H. Salot Jr. "The 'Ticking Time Bomb' of Counterfeit Electronic Parts." *Industry Week*, July 22, 2013. http://www.indus tryweek.com/procurement/ticking-time-bomb-counterfeit-electronic-parts.

Siewek, Stephen E. "The True Cost of Copyright Industry Piracy to the U.S. Economy." *The Institute for Policy Innovation*, Policy Report 189 (2007): 1–22. http://www. ipi.org/docLib/20120515_CopyrightPiracy.pdf.

Sorscher, Stan. "Trade Agreements Reveal How Life Will Be Organized in 2050." *Huffington Post-The Blog*, October 30, 2013. http://www.huffingtonpost.com/ stan-sorscher/trade-agreements-reveal-how-life_b_4090014.html.

Spolaore, Enrico. "National Borders, Conflict and Peace." In *Oxford Handbook of the Economics of Peace and Conflict*, edited by Michelle Garfinkel and Stergios Skaperdas. Oxford: Oxford University Press, 2012. http://sites.tufts.edu/enricos polaore/files/2012/08/National-Borders-Conflict-and-Peace.pdf.

Strindberg, Anders, and Mats Wärn. *Islamism*. Malden, MA: Polity Press, 2011.

Sutton, Jeannette, and Kathleen Tierney. "Disaster Preparedness: Concepts, Guidance, and Research." Report prepared for the Fritz Institute Assessing Disaster Preparedness Conference, Sebastopol, California, November 3–4, 2006. http://www.fritzinstitute.org/pdfs/whitepaper/disasterpreparedness-concepts.pdf.

Tajfel, Henri, ed. *Social Identity and Intergroup Relations*. European Studies in Social Psychology. Cambridge, CB2 8RU: Cambridge University Press, 1982.

Tonra, Joshua J. "The Threat of Border Security on Indigenous Free Passage Rights in North America." *Syracuse Journal of International Law & Commerce* 34 (Fall 2006): 221–258. http://web.ebscohost.com.libproxy.nps.edu/ehost/pdfviewer/ pdfviewer?sid=87060d4a-7453-4e9c-b40a-83669d29d438%40sessionmgr 115&vid=5&hid=128.

U.S. Customs and Border Protection. "C-TPAT: Program Overview." (n.d.). http://www.cbp.gov/linkhandler/cgov/trade/cargo_security/ctpat/ctpat_program_i nformation/what_is_ctpat/ctpat_overview.ctt/ctpat_overview.pdf.

———. *Fiscal Year 2009–2014 Strategic Plan*. Washington, DC, 2009. http://www.cbp. gov/linkhandler/cgov/about/mission/strategic_plans/strategic_plan_09_14.ctt/strat egic_plan_09_14.pdf.

———. *Intellectual Property Rights: Fiscal Year 2012 Seizure Statistics*, CBP Publication # 0172-0113. Washington, DC, 2013. http://www.cbp.gov/link handler/cgov/trade/priority_trade/ipr/seizure/fy2012_final_stats.ctt/fy2012_final_ stats.pdf.

———. "U.S. Immigration and Naturalization Service—Populating a Nation: A History of Immigration and Naturalization." (n.d.). http://www.cbp.gov/xp/cgov/about/ history/legacy/ins_history.xml.

U.S. Department of Homeland Security. "Budget-In-Brief: Fiscal Year 2012." (n.d.). http://www.dhs.gov/xlibrary/assets/budget-bib-fy2012.pdf.

———. "Secure and Manage Our Borders." (n.d.). http://www.dhs.gov/secure-and-manage-borders.

———. "The Strategic National Risk Assessment in Support of PPD 8: A Comprehensive Risk-Based Approach Toward a Secure and Resilient Nation." 2011. http://www.dhs.gov/xlibrary/assets/rma-strategic-national-risk-assessment-ppd8.pdf.

———. "Written testimony of CBP Border Patrol Chief Michael Fisher and Office of Field Operations Assistant Commissioner David Murphy for a House Committee on Oversight and Government Reform, Subcommittee on National Security Hearing titled "Border Security Oversight: Identifying and Responding to Current Threats." June 27, 2013. http://www.dhs.gov/news/2013/06/27/written-testimony-cbp-house-oversight-and-government-reform-subcommittee-national.

———. "Written testimony of U.S. Coast Guard Deputy for operations Policy & Capabilities Rear Admiral William Lee for a House Committee on Homeland Security, Subcommittee on Border and Maritime Security." February 26, 2013. http://www.dhs.gov/news/2013/02/26/written-testimony-us-customs-and-border-protection-house-committee-homeland-security.

U.S. Department of Justice. *Statement of Assistant Attorney General Lanny A. Breuer Before the Senate Judiciary Subcommittee on Crime and Terrorism*. November 1, 2011. http://www.justice.gov/criminal/pr/testimony/2011/crm-testimony-111101.html.

U.S. Department of State, Office of the Historian. "Chapter 2. Country Reports: South and Central Asia Overview." Country Reports on Terrorism 2012, Office of the Coordinator for Counterterrorism, May 30, 2013. http://www.state.gov/j/ct/rls/crt/2012/209983.htm.

———. "Milestones: 1801–1829, Rush-Bagot Pact." (n.d.). http://history.state.gov/milestones/1801-1829/Ruch-Bagot.

———. "Milestones: 1830–1860, The Amistad Case." (n.d.). http://history.state.gov/milestones/1830-1860/Amistad.

———. "Milestones: 1830–1860, Annexation of Texas." (n.d.). http://history.state.gov/milestones/1830-1860/TexasAnnexation.

———. "Milestones: 1830–1860, The First Opium War." (n.d.). http://history.state.gov/milestones/1830-1860/China1.

———. "Milestones: 1830–1860, Maritime Expansion Across Pacific." (n.d.). http://history.state.gov/milestones/1830-1860/PacificExpansion.

———. "Milestones: 1830–1860, The Oregon Territory, 1846." (n.d.). http://history.state.gov/milestones/1830-1860/OregonTerritory.

———. "Milestones: 1861–1865, The Civil War and International Diplomacy." (n.d.). http://history.state.gov/milestones/1861-1865.

———. "Milestones: 1914–1920, Wilsonian Diplomacy." (n.d.). http://history.state.gov/milestones/1914-1920.

U.S. Department of Treasury. "Treasury Sanctions Latin American Criminal Organization." Press Release, October 11, 2012. http://www.treasury.gov/press-center/press-releases/Pages/tg1733.aspx.

U.S. Government Accountability Office. *Border Patrol: Key Elements of New Strategic Plan Not Yet in Place to Inform Border Security Status and Resource Needs*. GAO-13-25. 2012. http://www.gao.gov/assets/660/650730.pdf.

———. *Border Security: CBP Lacks the Data Needed to Assess the FAST Program at U.S. Northern Border Ports*. GAO-10-694. 2010.

———. *Information Security: Cyber Threats Facilitate Ability to Commit Economic Espionage, Statement of Gregory C. Wilshusen, Testimony Before the Subcommittee on Counterterrorism and Intelligence, Committee on Homeland Security, House of Representatives*. GAO-12-876T. 2012. http://www.gao.gov/assets/600/592008.pdf.

———. *U.S.-Mexico Border: CBP Action Needed to Improve Wait Time Data and Measure Outcomes of Trade Facilitation Efforts*. GAO-13-603. 2013. http://www.gao.gov/assets/660/656140.pdf.

U.S. Immigration and Customs Enforcement. "HIS Arrests 20 Cuban Imposters Seeking Immigration Benefits." News Release. April 17, 2013, https://www.ice.gov/news/releases/1304/130417miami.htm.

———. "Statement of James A. Dinkins, Hearing on Border Security Threats to the Homeland: DHS's Response to Innovative Tactics and Techniques, Before the U.S. House of Representatives, Committee on Homeland Security, Subcommittee on Border and Maritime Security." June 19, 2012. http://www.ice.gov/doclib/news/library/speeches/120619dinkins.pdf.

Walkenhorst, Peter, and Nora Dihel. "Trade Impacts of Increased Border Security Concern." *The International Trade Journal* 20, no. 1 (2006): 1–31.

Willis, Henry H., Joel B. Predd, Paul K. Davis, and Wayne P. Brown. "Measuring the Effectiveness of Border Security Between Ports-of-Entry." RAND Technical Report, 2010. http://www.borders.arizona.edu/cms/sites/default/files/RAND_TR837-FINAL%20REPORT.pdf.

Wilson, Vincent Jr., ed. *The Book of Great American Documents*. Brookfield: MD: American History Research Associates, 2003.

World Trade Organization. "10 Benefits to the WTO Trade System." (n.d.). http://www.wto.org/english/thewto_e/whatis_e/10ben_e/10b07_e.htm.

CONSULTED WORKS

Alberts, David S. *Agility, Focus, and Convergence: The Future of Command and Control*. Office of the Assistant Secretary of Defense for Networks and Information Sharing Integration, Washington, DC: Command and Control Research Program (CCRP). 2007. http://www.dtic.mil/cgi-bin/GetTRDoc ?Location=U2&doc=GetTRDoc.pdf&AD=ADA503771.

Alberts, David S., and Richard E. Hayes. *Power to the Edge: Command...Control...in the Information Age*. Office of the Assistant Secretary of Defense, Washington, DC: Command and Control Research Program (CCRP). 2003. www.dodccrp.org/files/ Alberts_Power.pdf.

Andreas, Peter. "U.S.-Mexico Border Control in a Changing Economic and Security Context." Woodrow Wilson International Center for Scholars, Mexico Institute, *U.S.-Mexico Policy Bulletin* 1 (January 2005).

Appelo, Jurgen. *Management 3.0: Leading Agile Developers, Developing Agile Leaders*. Reading, MA: Addison-Wesley, 2010.

Barry, Tom. "The Border Patrol's Strategic Muddle." *Center for International Policy*, December 3, 2012. http://www.ciponline.org/research/html/border-patrol-strategic-muddle.

Brafman, Ori, and Rod A. Beckstrom. *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations*. New York: Portfolio, 2006.

Caldwell, Christopher. *Reflections on the Revolution in Europe*. New York: Anchor Books, 2009.

Capra, Fritjof. *The Hidden Connections: Integrating the Biological, Cognitive and Social Dimensions into a Life Science of Sustainability*. New York: Anchor Books, 2002.

de Weijer, Frauke. "Resilience: A Trojan Horse for a New Way of Thinking?" *European Centre for Development Policy Management (ECDPM).* Discussion Paper No.139, January 2013. http://www.ecdpm.org/Web_ECDPM/Web/Content/Download.nsf/0/7078 ABFDB01C538FC1257B3A00405702/$FILE/DP%20139_Resilience%20paper_J an2013%20%282%29.pdf.

Desouza, Kevin C., and Yuan Lin. "Towards Evidence-Driven Policy Design: Complex Adaptive Systems and Computational Modeling." *The Innovation Journal: The Public Sector Innovation Journal* 16, no. 1 (2011): Article 7. http://www. innovation.cc/scholarly-style/desouza_lin_policy_informatics_v16i1a7.pdf.

Erwin, Sandra I., Stew Magnuson, Dan Parsons, and Yasmin Tadjdeh. "Top Five Threats to National Security in the Coming Decade." *National Defense Magazine*, November 2012. http://www.nationaldefensemagazine.org/archive/2012/November/Pages/TopFiveThreatstoNationalSecurityintheComingDecade.aspx.

Frankfurt, Harry G. *On Bullshit*. Princeton, NJ: Princeton University Press, 2005.

Friedman, Thomas L. *Hot, Flat, and Crowded*. New York: Farrar, Straus and Giroux, 2008.

Glain, Stephen. *State Vs. Defense: The Battle to Define America's Empire*. New York: Crown Publishers, 2011.

Graham, Stephen, ed. *Disrupted Cities: When Infrastructure Fails*. New York: Routledge, 2010.

Government of Canada, *Perimeter Security and Economic Competitiveness Action Plan*. December 2011. http://actionplan.gc.ca/grfx/psec-scep/pdfs/bap_report-paf_rapport-eng-dec2011.pdf.

Hagel III, John, John S. Brown, and Lang Davison. *The Power of Pull: How Small Moves, Smartly Made, Can Set Big Things in Motion.* New York: Basic Books, 2012.

Hamel, Gary, and Bill Breen. *The Future of Management.* Boston, MA: Harvard Business School Press, 2007.

Hecker, Achim. "Knowledge Beyond the Individual? Making Sense of a Notion of Collective Knowledge in Organization Theory." *Organization Studies* 33, no. 3 (March 2012): 423–445.

Hedges, Chris. *War Is a Force That Gives Us Meaning*. New York: Anchor Books, 2002.

Heer, Jeffrey, and Maneesh Agrawala. "Design Considerations for Collaborative Visual Analytics." *Information Visualization* 7, no. 1 (2008): 49–62.

Hobbes, Thomas. *Human Nature and De Corpore Politico*. New York: Oxford University Press, 1994.

Hobbing, Peter, and Rey Koslowski. *The Tools Called to Support the 'Delivery' of Freedom, Security and Justice: A Comparison of Border Security System in the EU and in the U.S. Directorate General Internal Policies of the Union Briefing Paper Report PE 410.681*. Brussels, BEL: European Parliament, February 2009. http://www.europarl.europa.eu/RegData/etudes/note/join/2009/410681/IPOL-LIBE_NT%282009%29410681_EN.pdf.

Homeland Security Advisory Council. "Southwest Border Task Force Report: Third Set of Recommendations." Fall 2011. http://www.dhs.gov/xlibrary/assets/hsac-southwest-border-task-force.pdf.

Hunt, Earl. "Book Review of Adaptive Thinking: Rationality in the Real World." Review of *Adaptive Thinking: Rationality in the Real World*, by Gerd Gigerenzer. *Evolutionary Psychology* 1 (2003): 172–187. http://www.epjournal.net/wp-content/uploads/ep01172187.pdf.

Johnson, Chalmers. *Blowback: The Costs and Consequences of American Empire*. New York: Metropolitan Books/Henry Holt and Company, 2000.

King, Gary, and Christopher J. L. Murray. "Rethinking Human Security." *Political Science Quarterly* 116, no. 4 (2001): 585–610.

Klein, Gary. *Sources of Power: How People Make Decisions*. Cambridge, MA: The MIT Press, 1998.

Klein, Gary, and Caroline E. Zsambok. *Naturalistic Decision Making*. Mahwah, NJ: Erlbaum, Lawrence, Associates, 1997.

Klein, Gary, Judith Orasanu, Roberta Calderwood, and Caroline E. Zsambok. eds. *Decision Making in Action: Models and Methods.* Westport, CT: Ablex Publishing Co., 1993.

Klein, Stefan. *Leonardo's Legacy*. Philadelphia, PA: Da Capo Press, 2008.

Kotler, Phillip, and John Caslione. *Chaotics: The Business of Managing and Marketing in the Age of Turbulence.* New York: Amacom, 2005.

Kotter, John. *Our Iceberg Is Melting*. New York: St. Martin's Press, 2005.

Kupchan, Charles A. *No One's World: The West, The Rising Rest, and the Coming Global Turn*. New York: Oxford University Press, 2012.

Lewis, Ted. *Bak's Sand Pile: Strategies for a Catastrophic World*. Williams, CA: Agile Press, 2011.

McDaniel, Elizabeth, Mary McCully, and Robert D. Childs. "Becoming a "Sense-and-Respond" Academic and Government Organisation." *The Electronic Journal of Knowledge Management (EJKM)* 5, no. 2 (2007): 215–222. www.ejkm.com/issue/download.html?idArticle=105.

Mill, John Stuart. *On Liberty*. New York: Barnes & Noble, 2004.

Pham, Michel T., Tom Meyvis, and Rongrong Zhou. "Beyond the Obvious: Chronic Vividness of Imagery and the Use of Information in Decision Making." *Organizational Behavior and Human Decision Processes* 84, no. 2 (March 2001): 226–253.

Pirolli, Peter, and Stuart Card. "The Sensemaking Process and Leverage Points for Analyst Technology as Identified through Cognitive Task Analysis." in *Proceedings of International Conference on Intelligence Analysis* 5 (May 2005): 2–4. http://vadl.cc.gatech.edu/documents/2__card-sensemaking.pdf.

Pojman, Louis P. *The Logic of Subjectivity: Kierkegaard's Philosophy of Religion*. University, AL: The University of Alabama Press, 1984.

Prete, Frederick R. *Complex Worlds from Simpler Nervous Systems*. Cambridge, MA: The MIT Press, 2004.

Richardson, George P. "Problems with Causal-Loop Diagrams." *System Dynamics Review* 2, no. 2 (1986): 158–170. http://www.systems-thinking.org/intst/d-3312.pdf.

Scahill, Jeremy. *Dirty Wars: The World is a Battlefield*. New York: Nation Books, 2013.

Scheuer, Michael. *Imperial Hubris*. Washington, DC: Potomac Books, Inc., 2004.

Skaine, Rosemarie. *Female Suicide Bombers*. Jefferson, NC: McFarland & Company, Inc., 2006.

Slack, Jeremy, Daniel Martinez, and Scott Whiteford. "Border Militarization and Health: Violence, Death, and Security." *The Selected Works of Scott Whiteford*, 2013. http://works.bepress.com/scott_whiteford/9.

Sloman, Steven A., David Over, Lila Slovak, and Jeffrey Stibel. "Frequency Illusions and Other Fallacies." *Organizational Behavior and Human Decision Processes* 9 (2003): 296–309.

Sterman, John D. "System Dynamics Modeling: Tools for Learning in a Complex World." *California management review* 43, no. 4 (2001): 8–25. http://www.systemdynamics.org/conferences/2002/proceed/papers/CAREVIEW/C2STERMA.PDF.

Stewart, Mark G., and John Mueller. *Assessing the Costs and Benefits of United States Homeland Security Spending*. Research Report No. 265.04. Centre for Infrastructure Performance and Reliability, University of New Castle Australia. (n.d.). http://politicalscience.osu.edu/faculty/jmueller//stewarr2.pdf.

Todd, P., and G. Gigerenzer. "Putting Naturalistic Decision Making into the Adaptive Toolbox." *Journal of Behavioral Decision Making* 14 (2001): 381–383.

Tufte, Edward R. *Visual Explanations: Images and Quantities, Evidence and Narrative*. Cheshire, CT: Graphics Press LLC, 1997.

Tversky, Amos, and Daniel Kahneman. "Judgment Under Uncertainty: Heuristics and Biases." *Science*, New Series 185, no. 4157 (September 27, 1974): 1124–1131. http://psiexp.ss.uci.edu/research/teaching/Tversky_Kahneman_1974.pdf.

U.S. Commission on National Security/21st Century. *Road Map for National Security: Imperative for Change, The Phase III Report of the U.S. Commission on National Security/21st Century*. Washington, DC: February 15, 2001. http://www.au.af.mil/au/awc/awcgate/nssg/phaseIIIfr.pdf.

———. *Seeking a National Strategy: A Concert for Preserving Security and Promoting Freedom, The Phase II Report on a U.S. National Security Strategy for the 21st Century*. Washington, DC: April 15, 2000. http://www.au.af.mil/au/awc/awcgate/nssg/phaseII.pdf.

U.S. Department of Homeland Security. *Northern Border Strategy*. June 2012. http://www.hsdl.org/?view&did=710991.

U.S. Department of State. "U.S. Relations with Canada Fact Sheet." under *Bureau of Western Hemisphere Affairs*. (n.d.). http://www.state.gov/r/pa/ei/bgn/2089.htm.

U.S. Government Accountability Office. *2013 Annual Report: Actions Needed to Reduce Fragmentation, Overlap, and Duplication and Achieve Other Financial Benefits*. GAO-13-279SP. 2013. http://www.gao.gov/assets/660/653604.pdf.

Vogelsang, John. "Futuring: A Complex Adaptive Systems Approach to Strategic Planning." *Support Centre for Non-profit Management* (2004). http://www.supportcenteronline.org/images/pdf/futuring.pdf.

Wall, Erika. "Structure of Meaning and Sense-Making of Risk: An Operationalisation of Sense-Making Tested by Grouping Individuals According to their Structure of Meaning." *Journal of Risk Research* 14, no. 6 (2011): 735–755.

Ware, Colin. *Information Visualization: Perception for Design.* San Francisco, CA: Morgan Kauffman Publishers, 2000.

Wolpert, David, and David S. Leslie. "Information Theory and Observational Limitations in Decision Making." *The BE Journal of Theoretical Economics* 12, no. 1 (2012).

Young, Mark D. "United States Government Cybersecurity Relationships." *Information Society Journal of Law and Policy (ISJLP)* 8 (2012): 281–439.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1.   Defense Technical Information Center
        Ft. Belvoir, Virginia

2.   Dudley Knox Library
        Naval Postgraduate School
        Monterey, California